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Park et al.

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(54) **UNIT TYPE AIR CONDITIONER**

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(73) Assignee: **LG Electronics Inc.**, Seoul (KR)

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Feb. 25, 2003 (KR) 2003-0011814
Feb. 26, 2003 (KR) 2003-0011909
Mar. 5, 2003 (KR) 2003-0013821

(51) **Int. Cl.**[7] **F25D 23/12**
(52) **U.S. Cl.** **62/262**; 62/298
(58) **Field of Search** 62/262, 298, 404, 62/407, 285

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(57) **ABSTRACT**

Unit type air conditioner including a base plate in a bottom part thereof, a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof, a discharge frame in the discharge opening for controlling flow of the air discharged into the room, a barrier on a center part of the base plate to divide the base plate into indoor side base and an outdoor side base, an air guide on the indoor side base, having an indoor fan mounted therein, a discharge guide for guiding the air passed through the air guide to the discharge frame, and a control box at a side of the air guide for fitting electric components therein, thereby diversifying air flow directions to a room, simplifying indoor fan and indoor motor assembly structure, and improving a structure of the control box for easy maintenance of the electric components, and preventing fire from spreading.

31 Claims, 20 Drawing Sheets

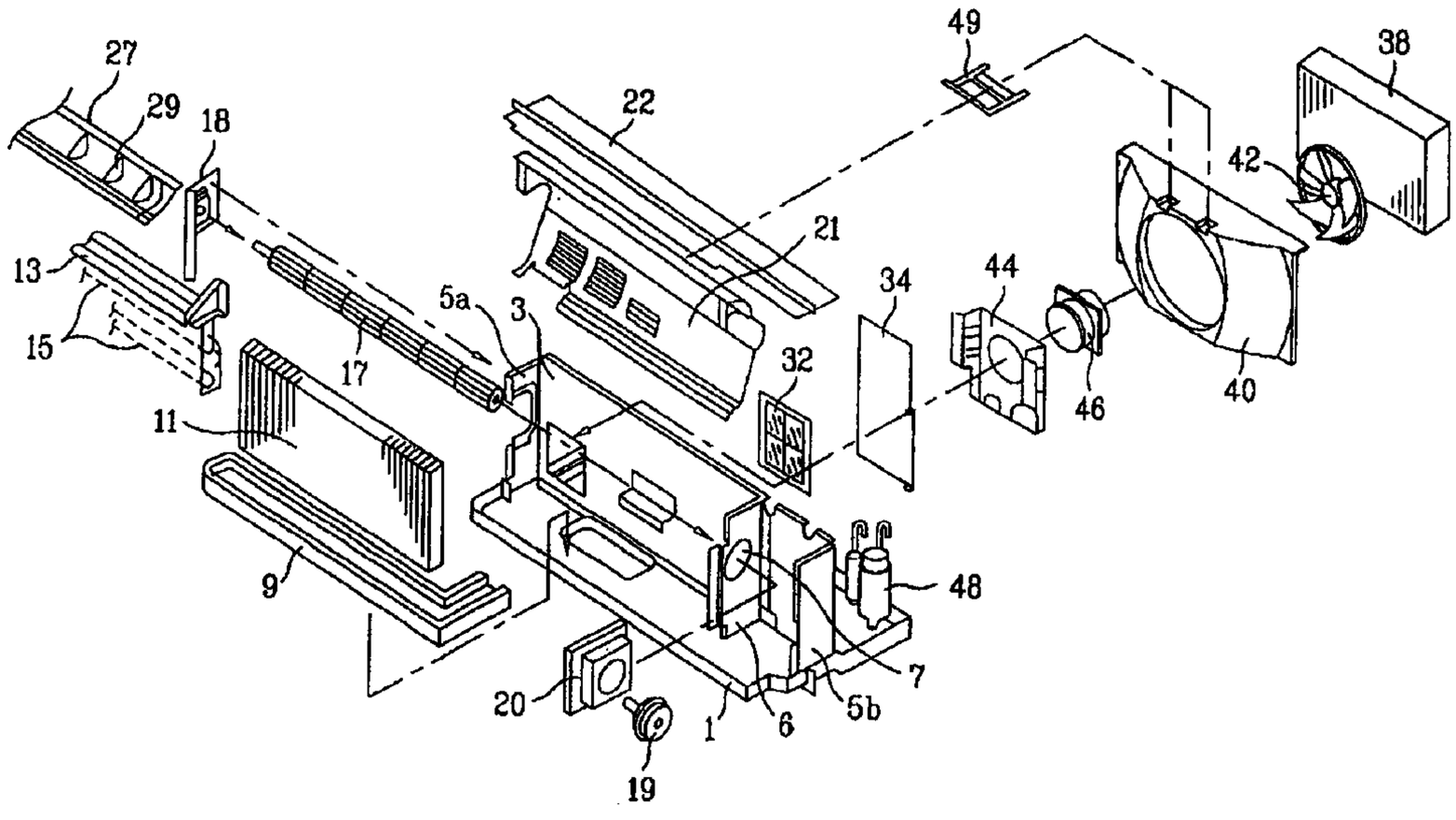

FIG. 1

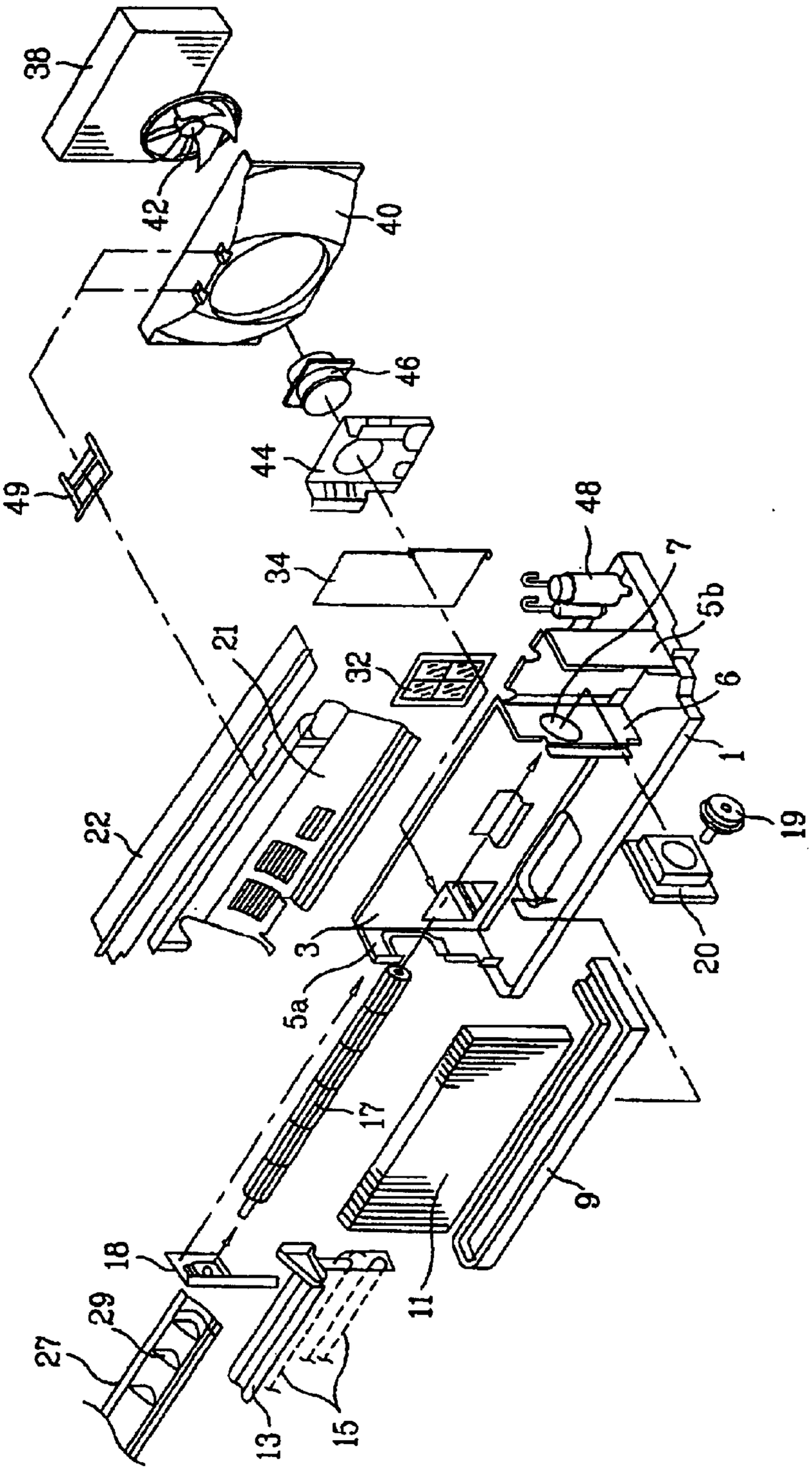

FIG. 2

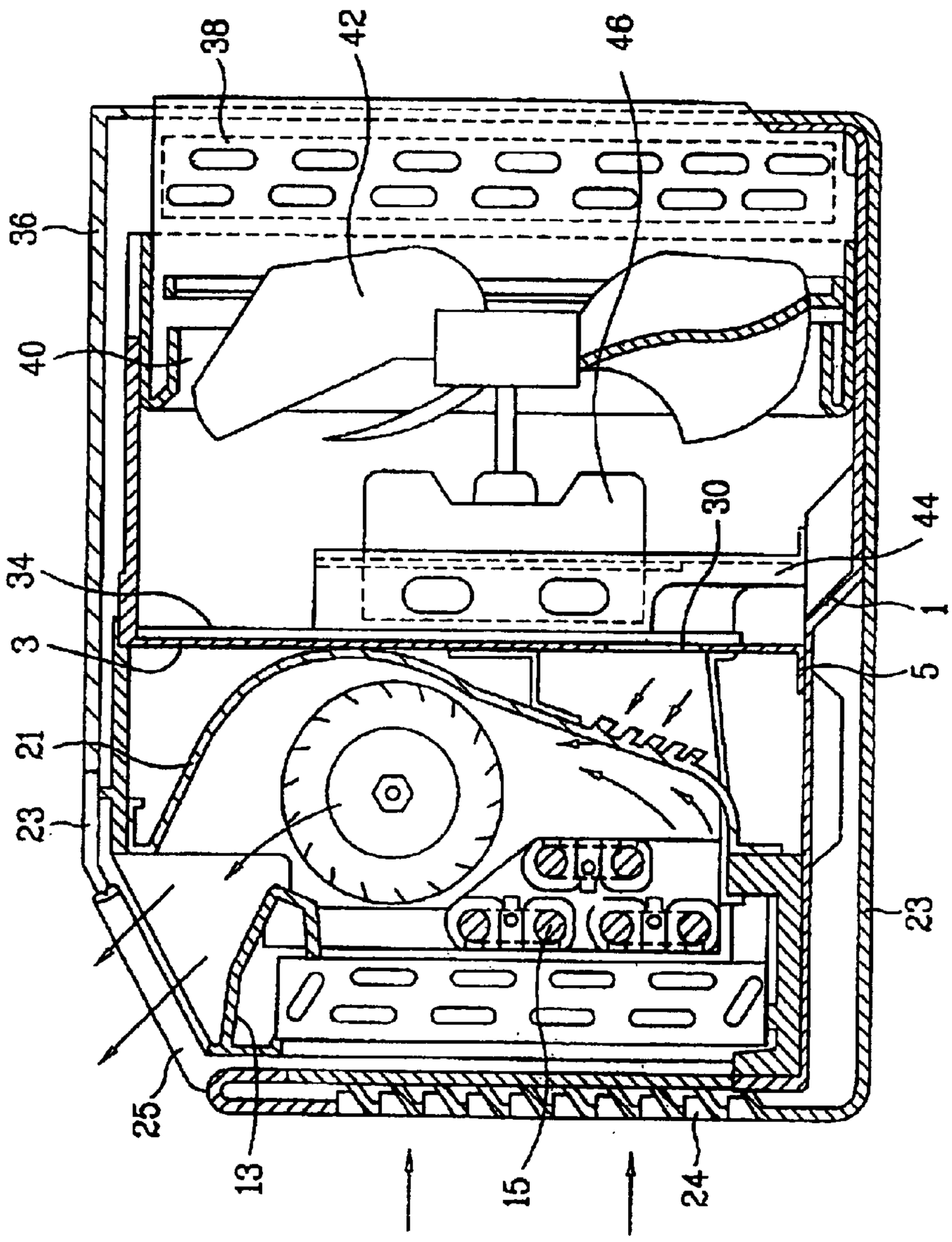

FIG. 3

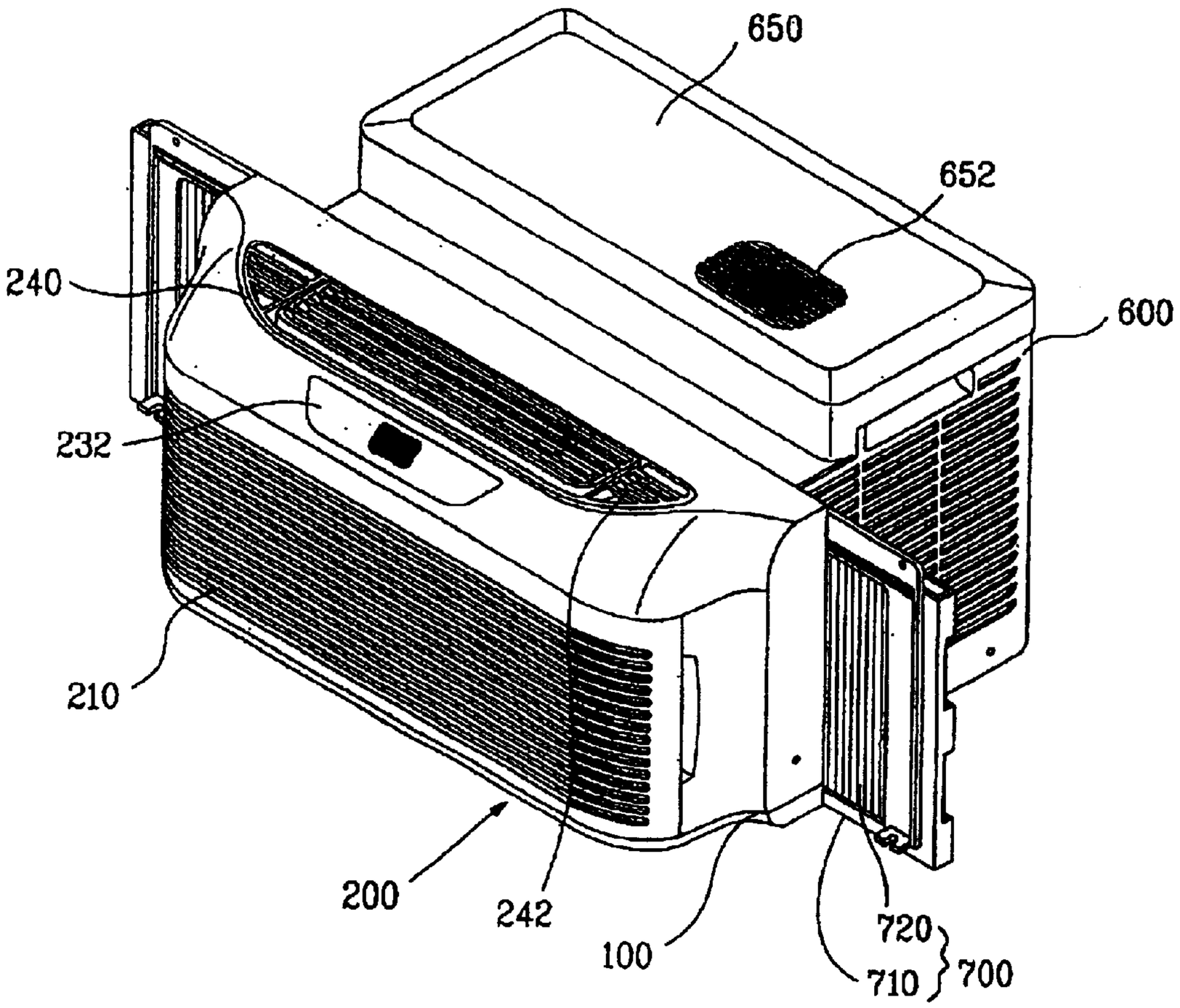

FIG. 4

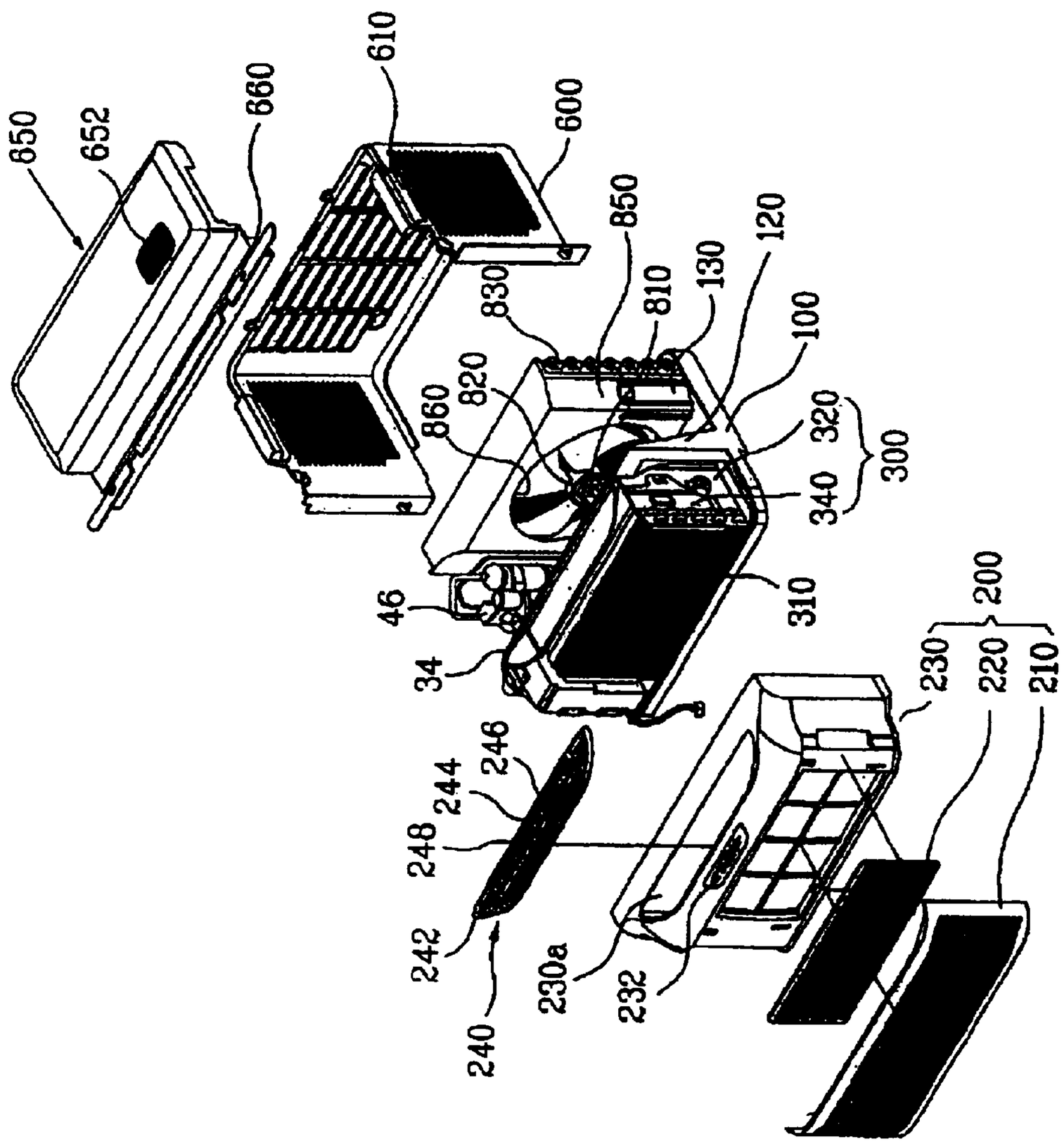
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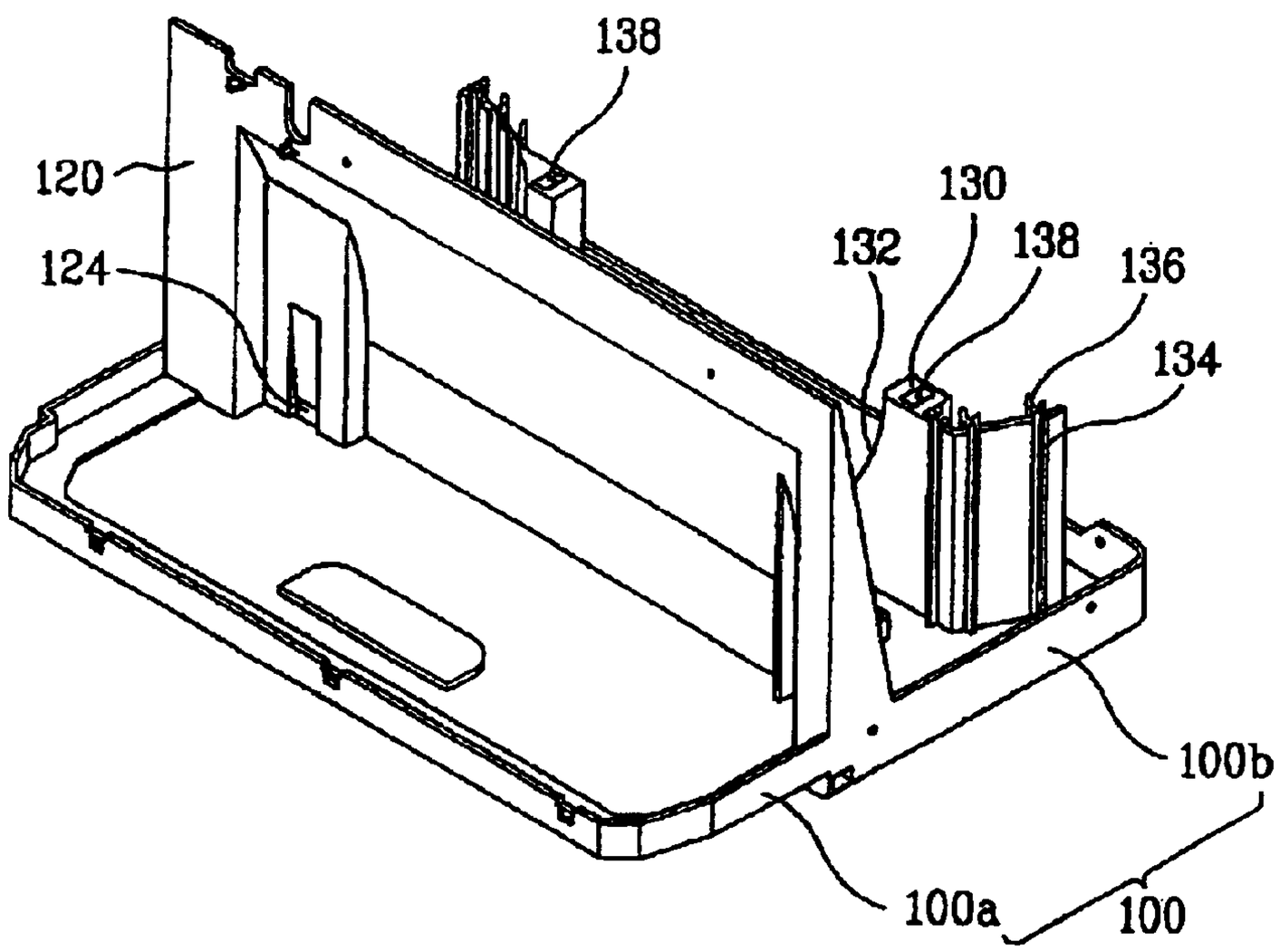
FIG. 5



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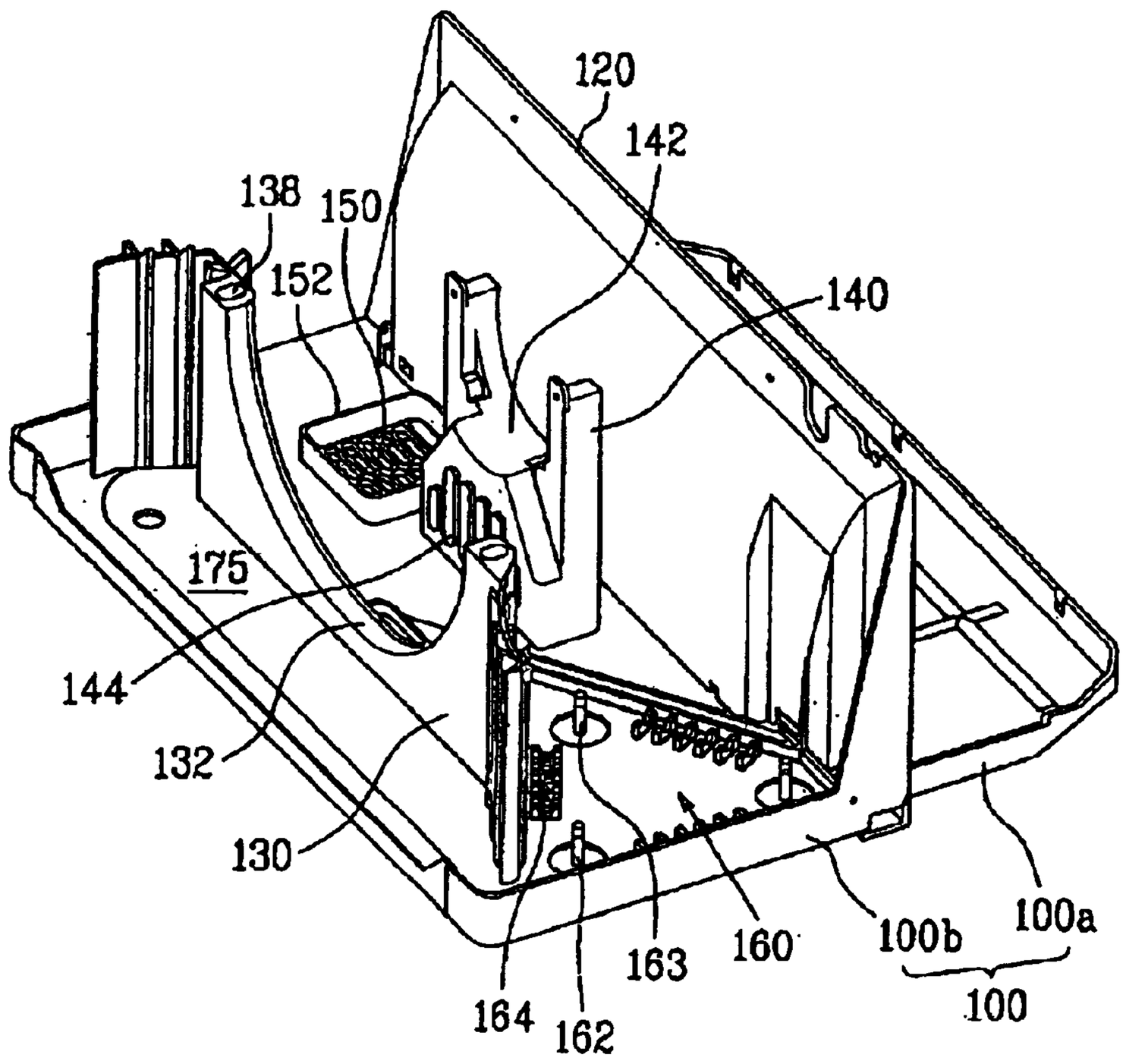
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FIG. 7

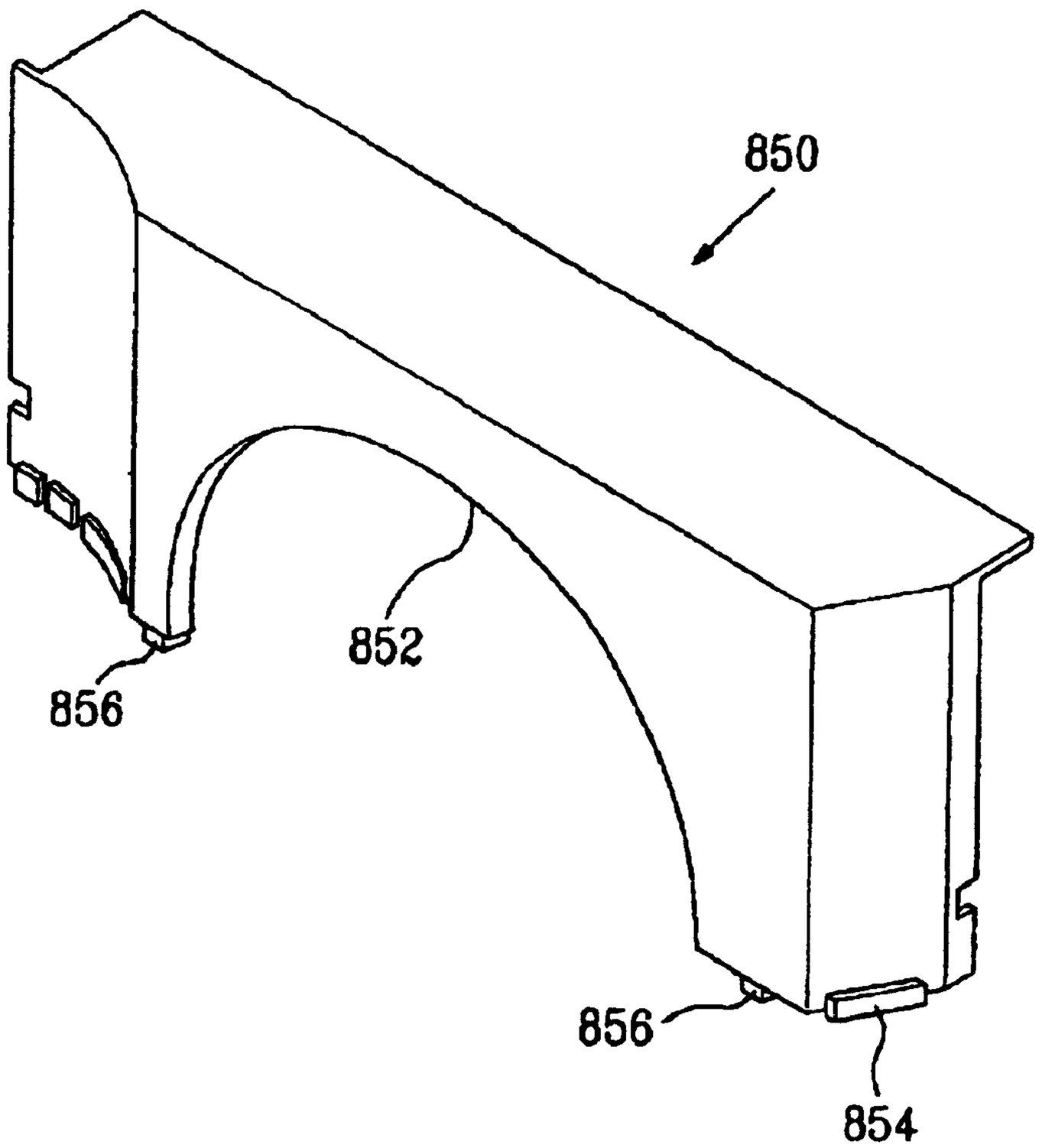

FIG. 8

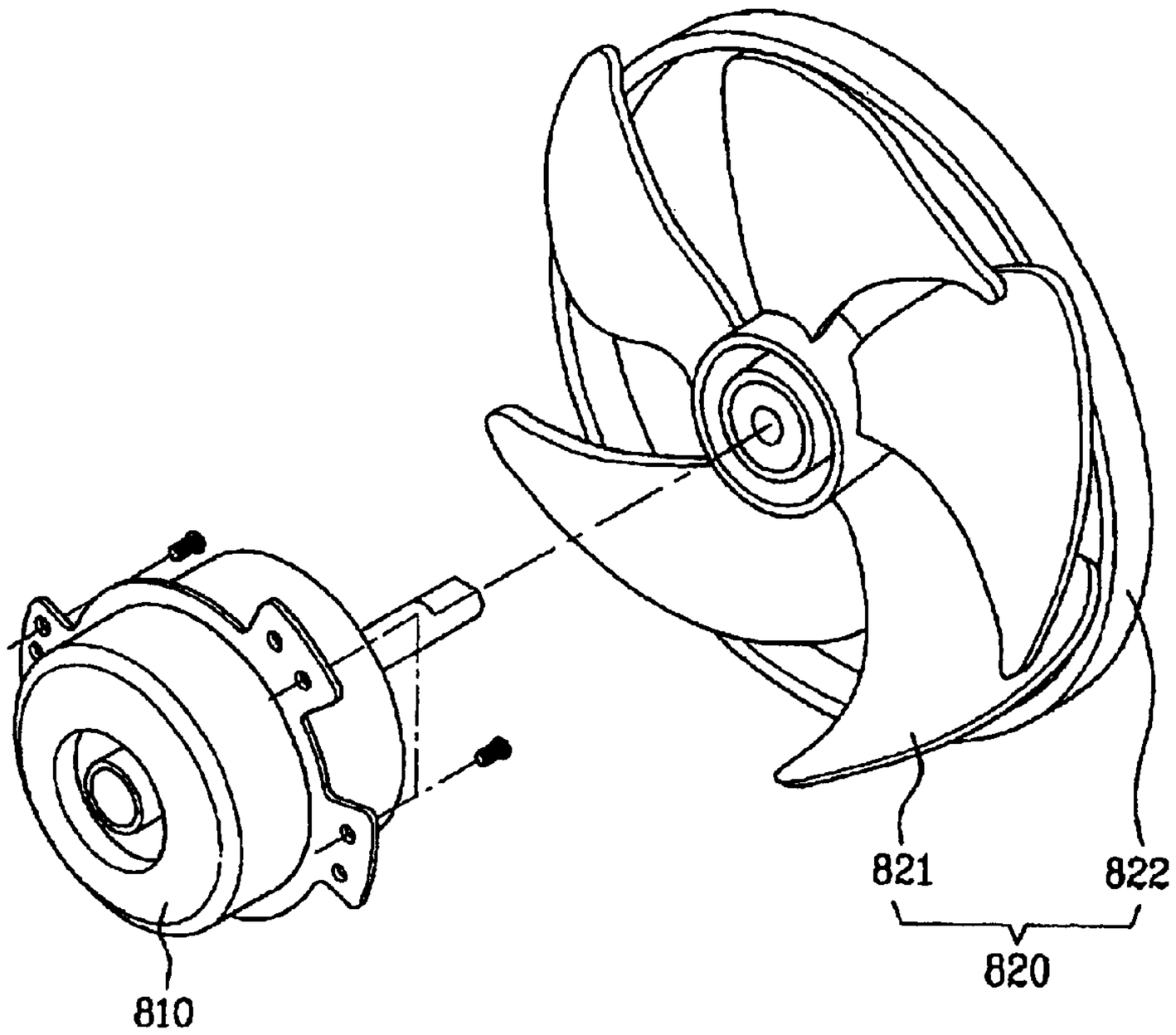

FIG. 9A

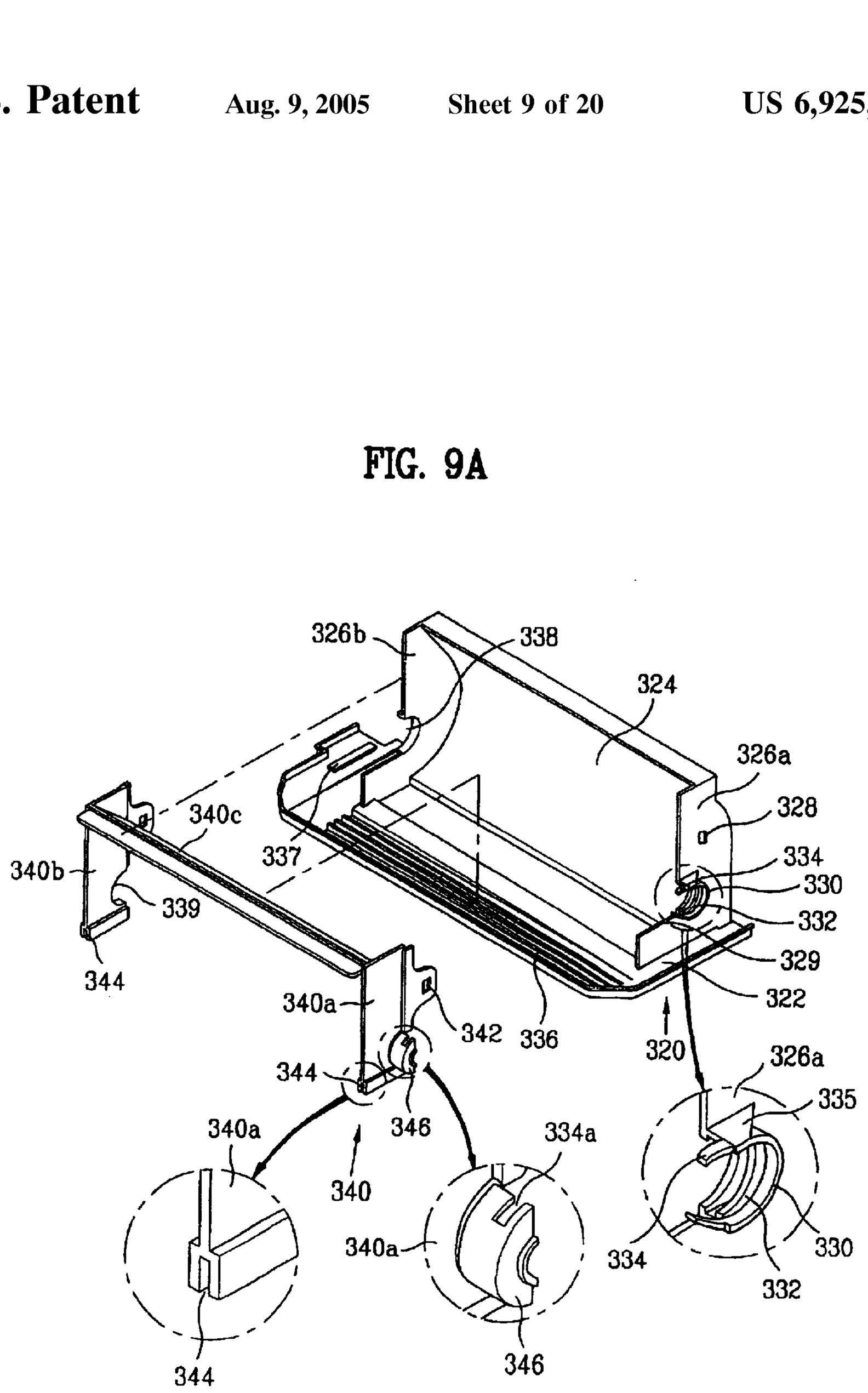
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FIG. 9B

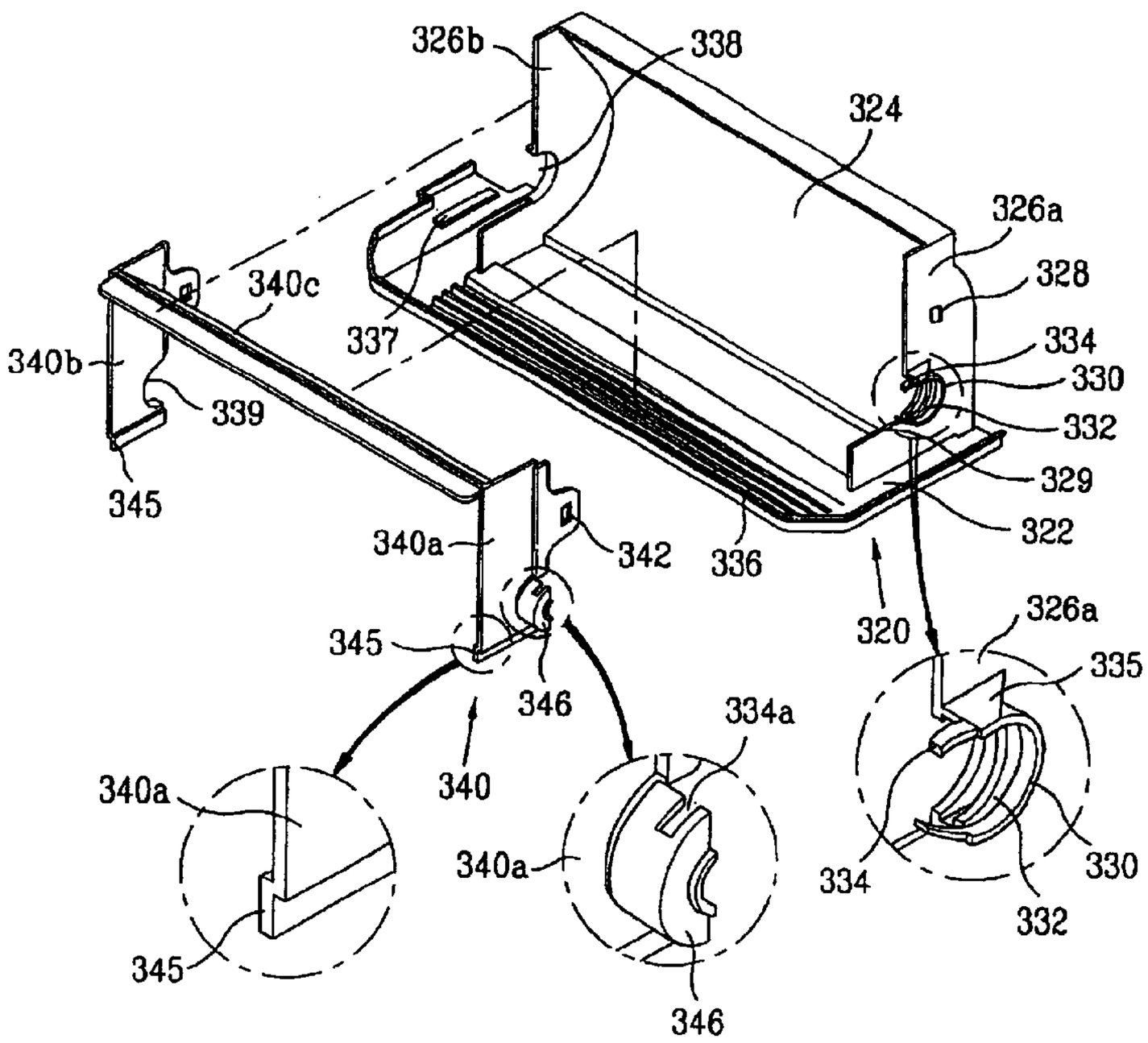
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FIG. 10

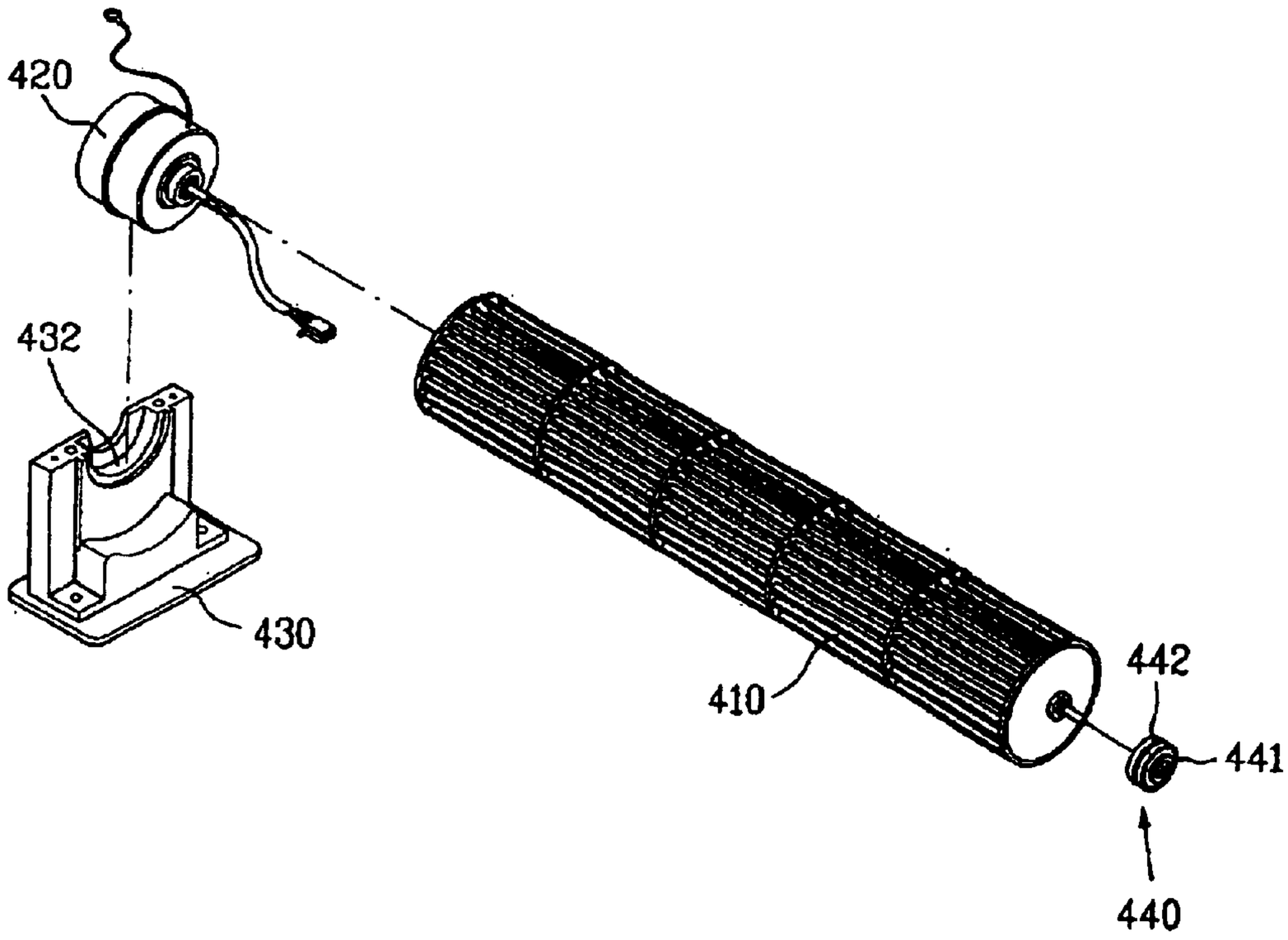

FIG. 11

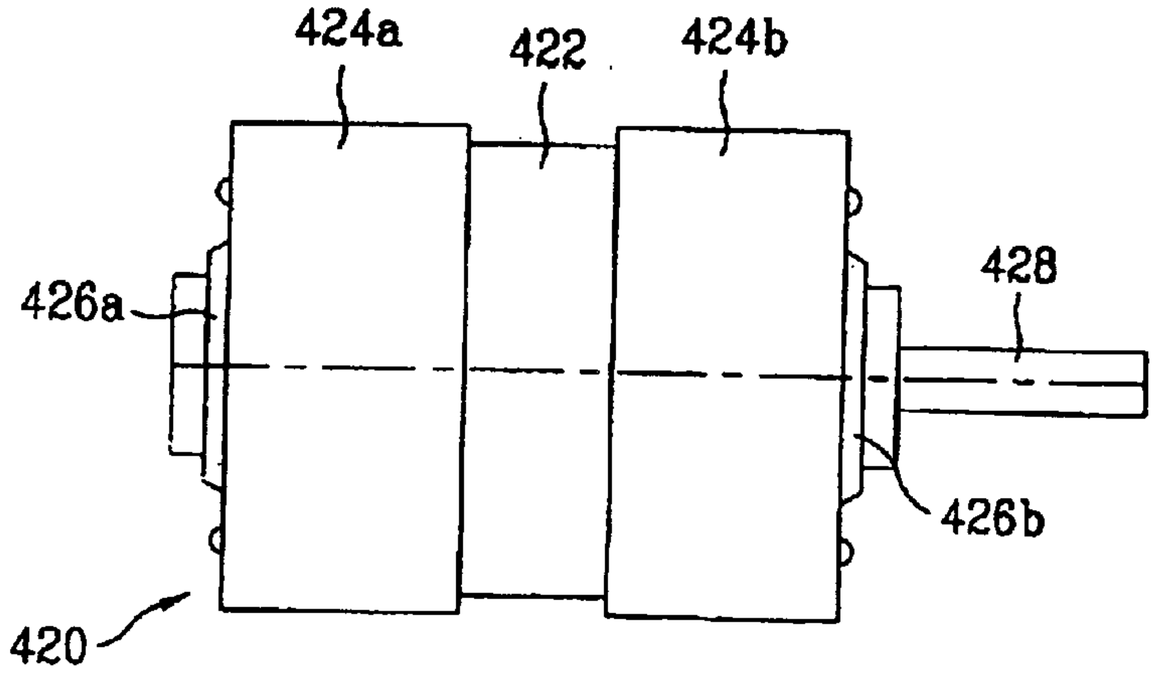

FIG. 12

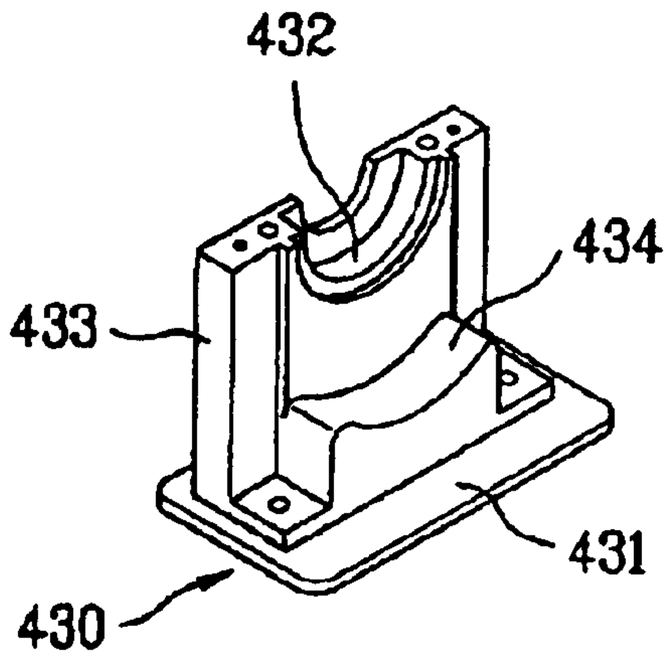

FIG. 13

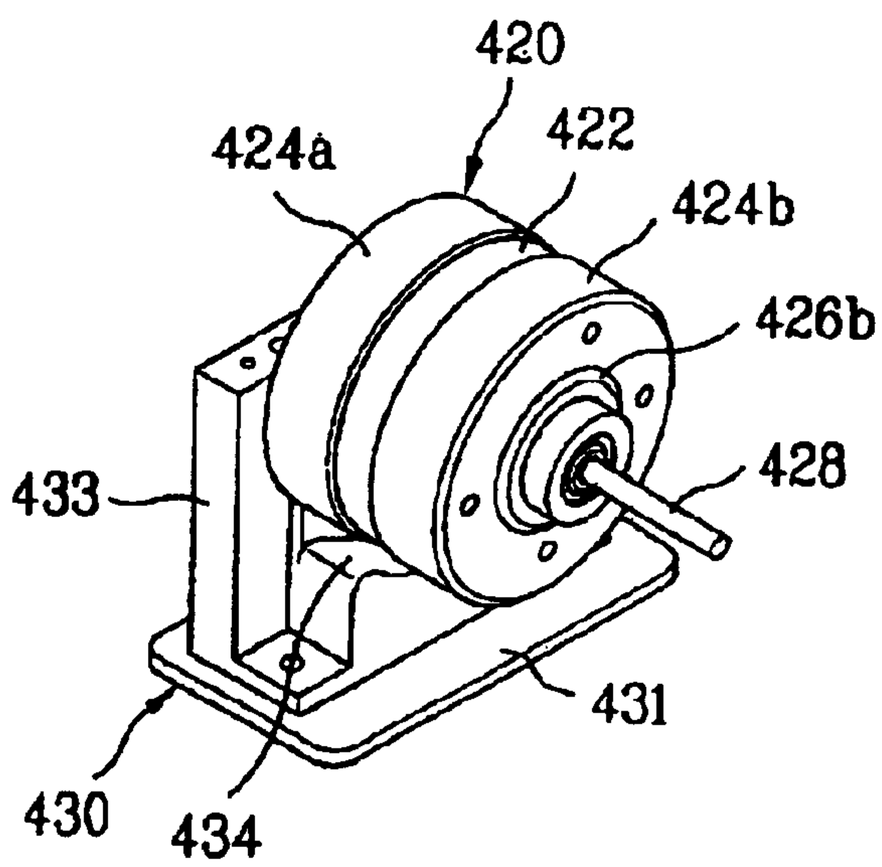

FIG. 14

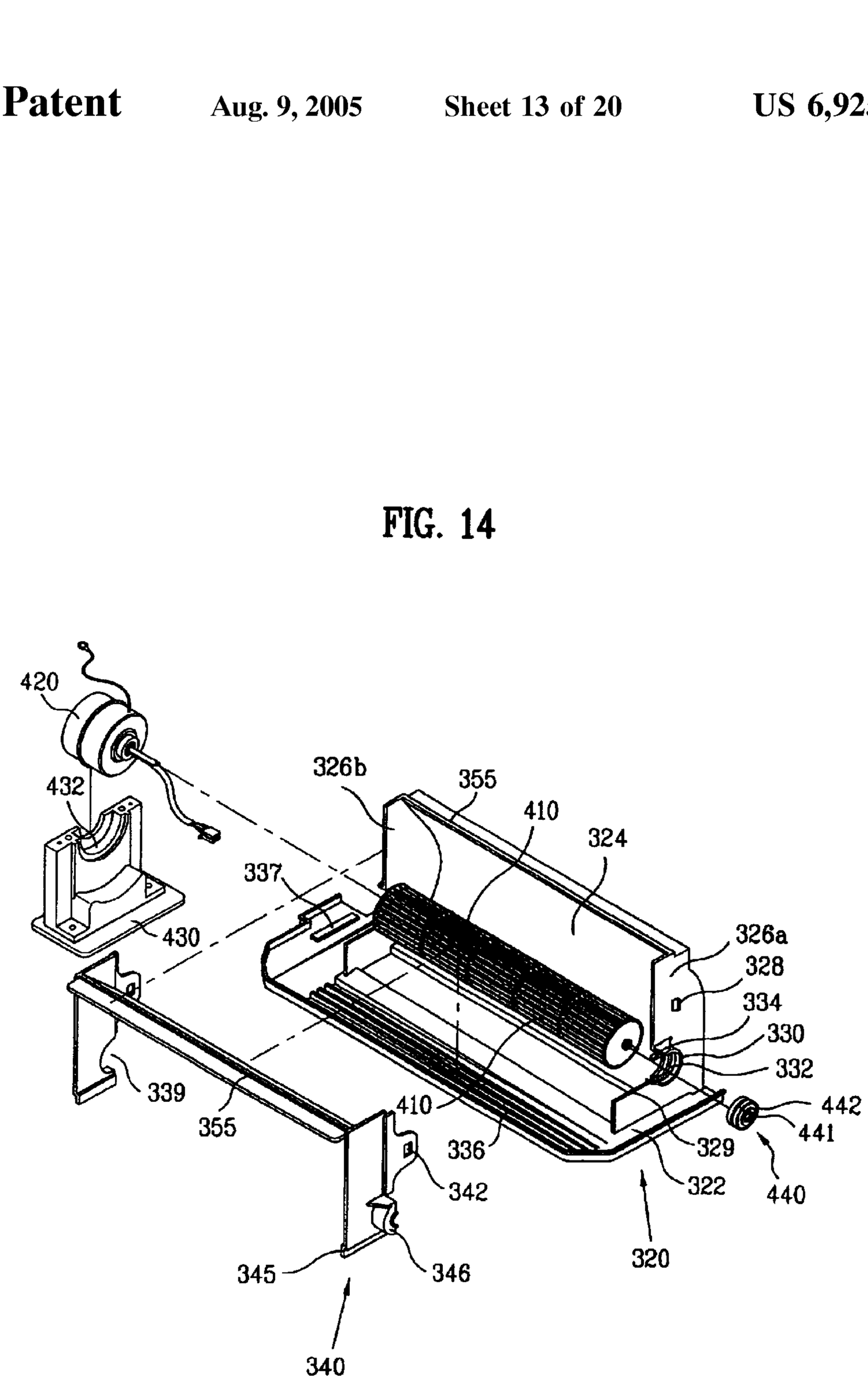
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FIG. 15

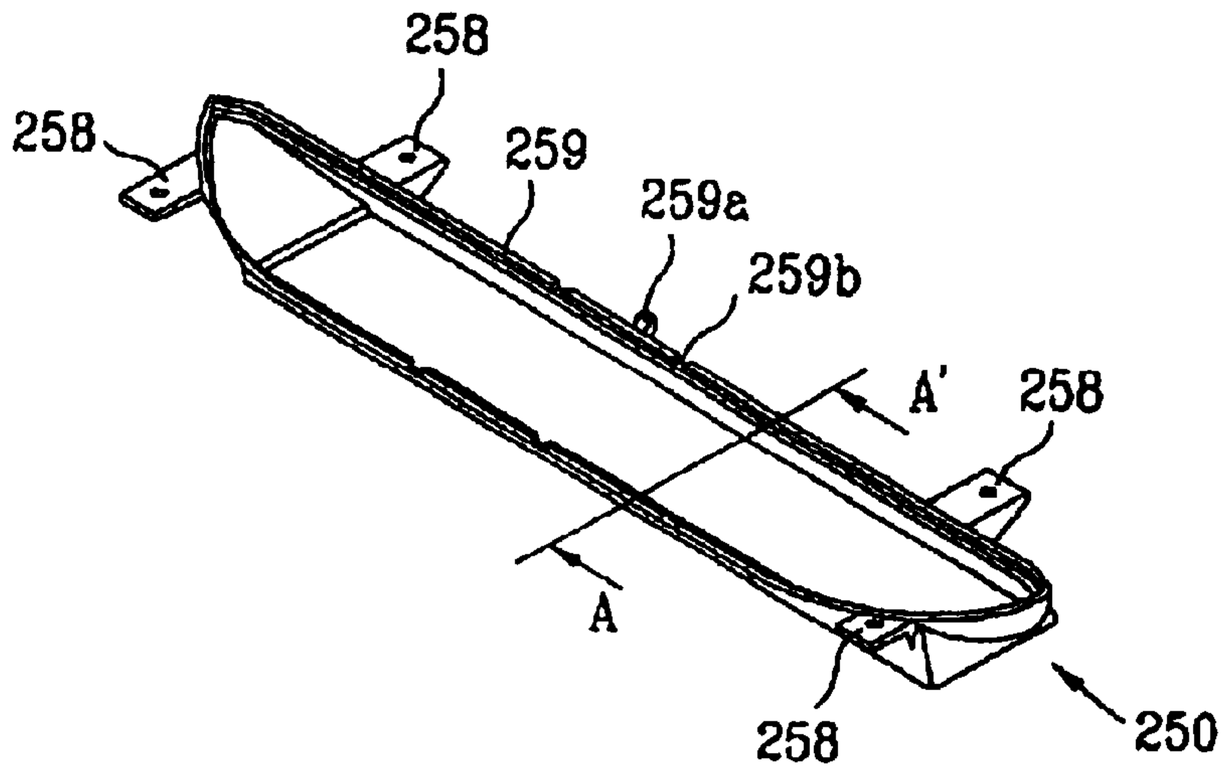

FIG. 16

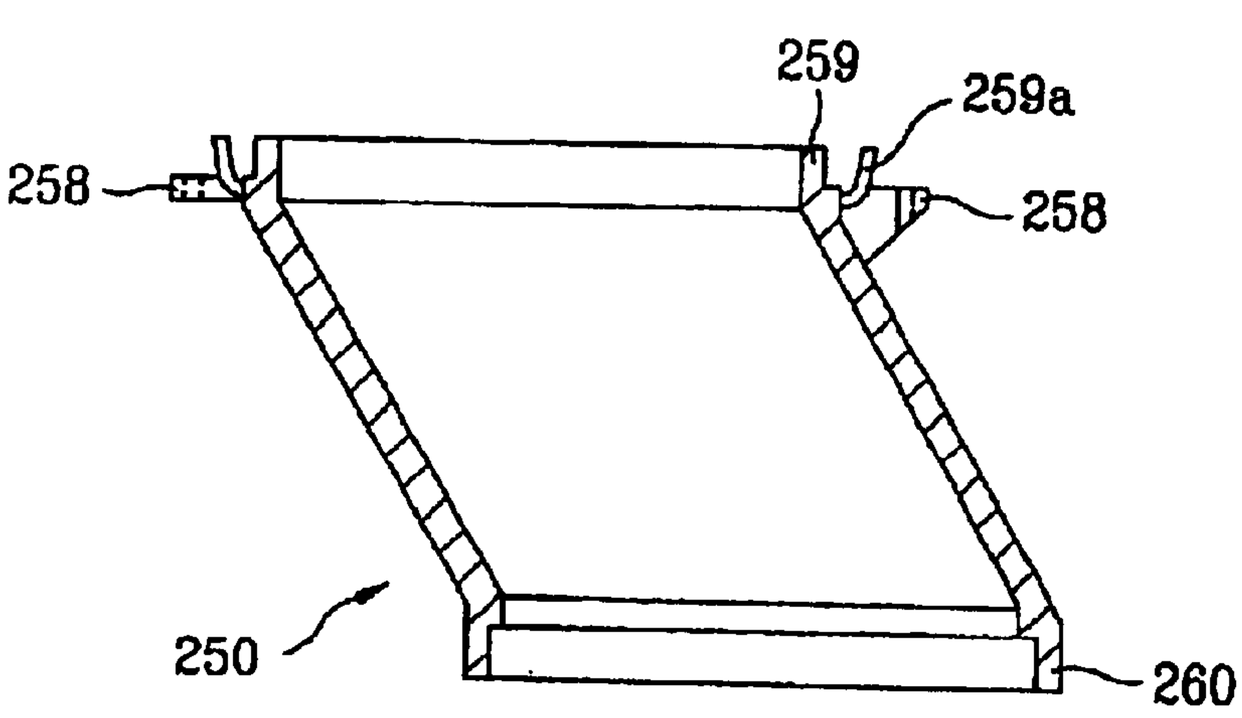

FIG. 17

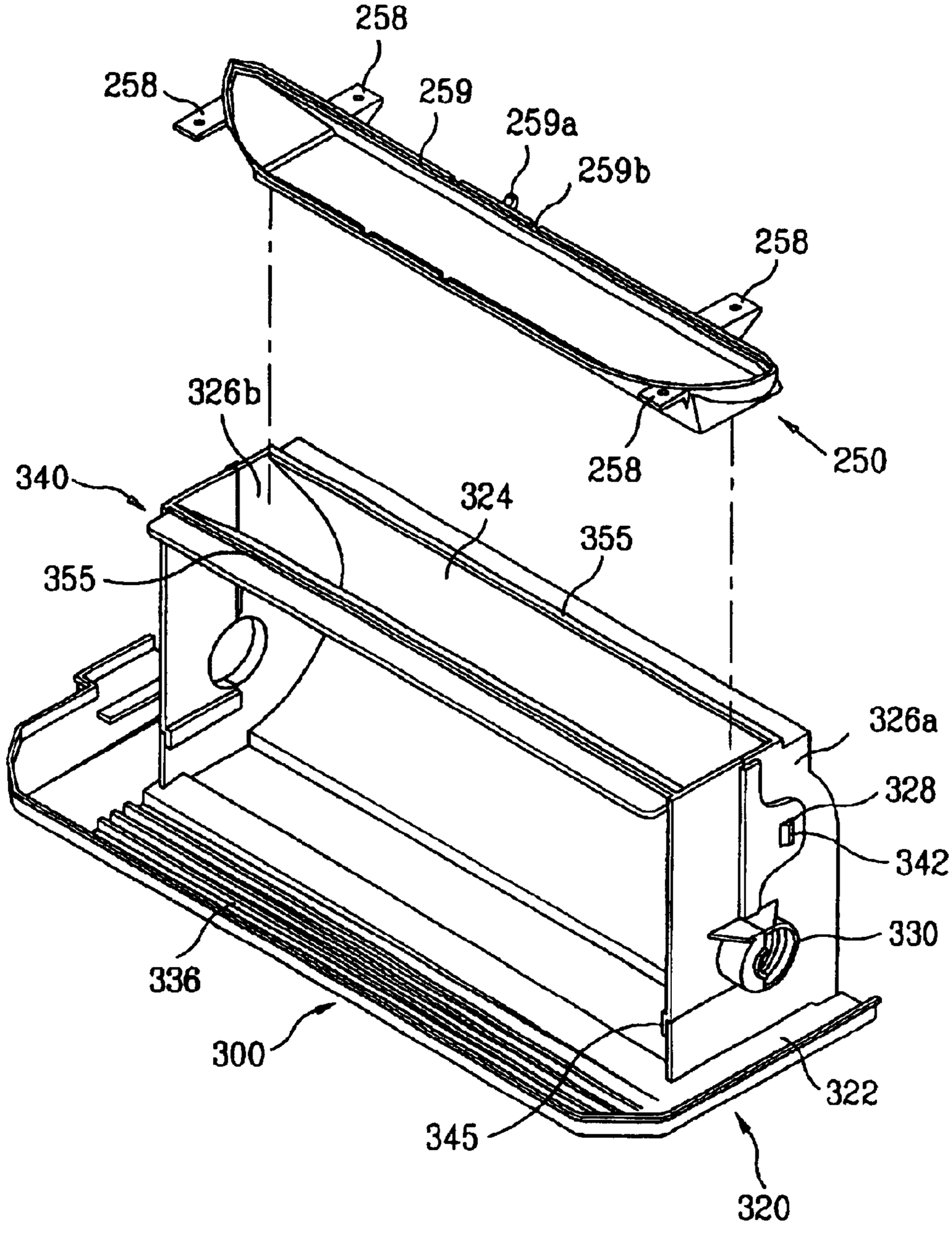
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FIG. 18

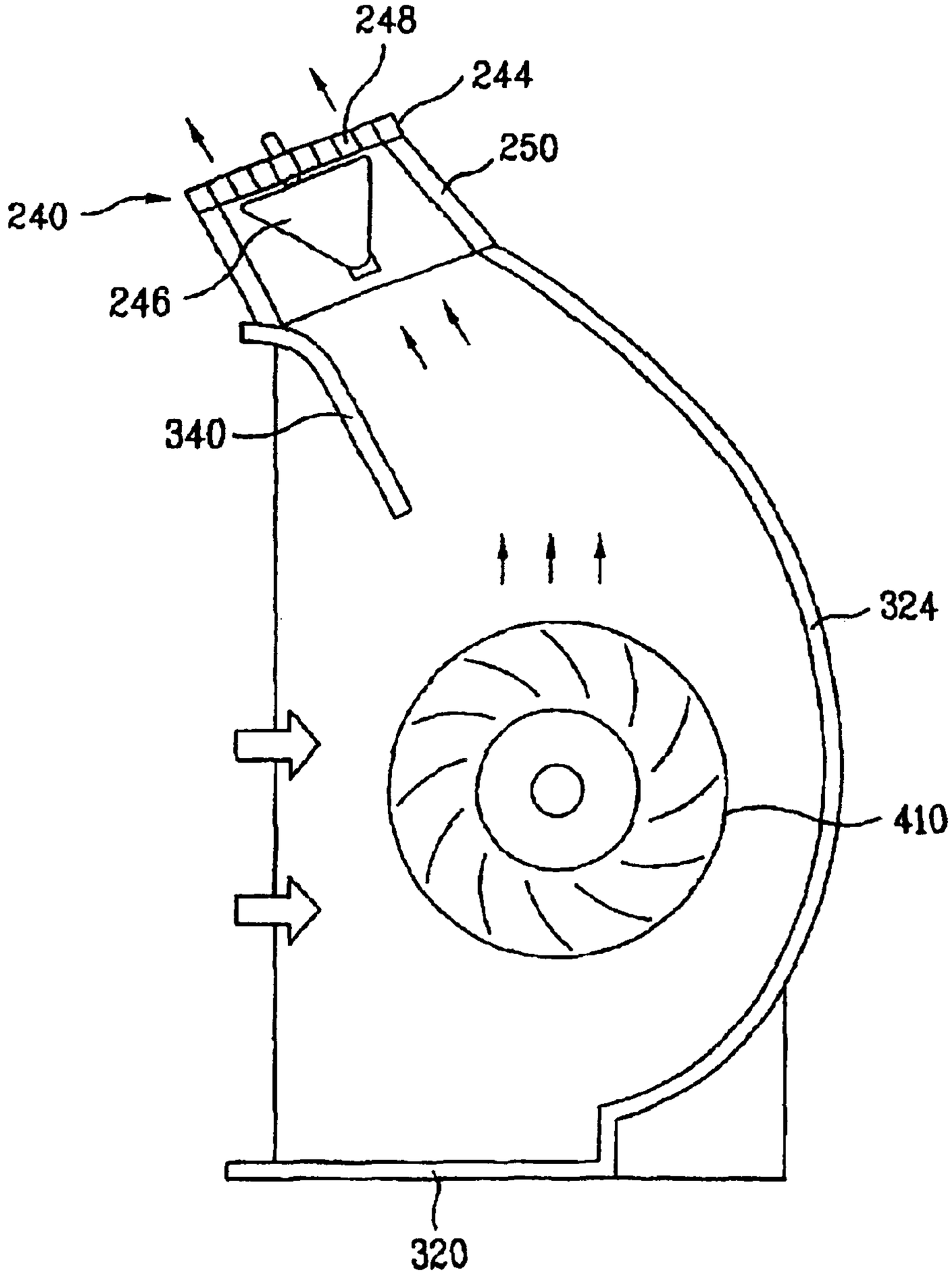

FIG. 19

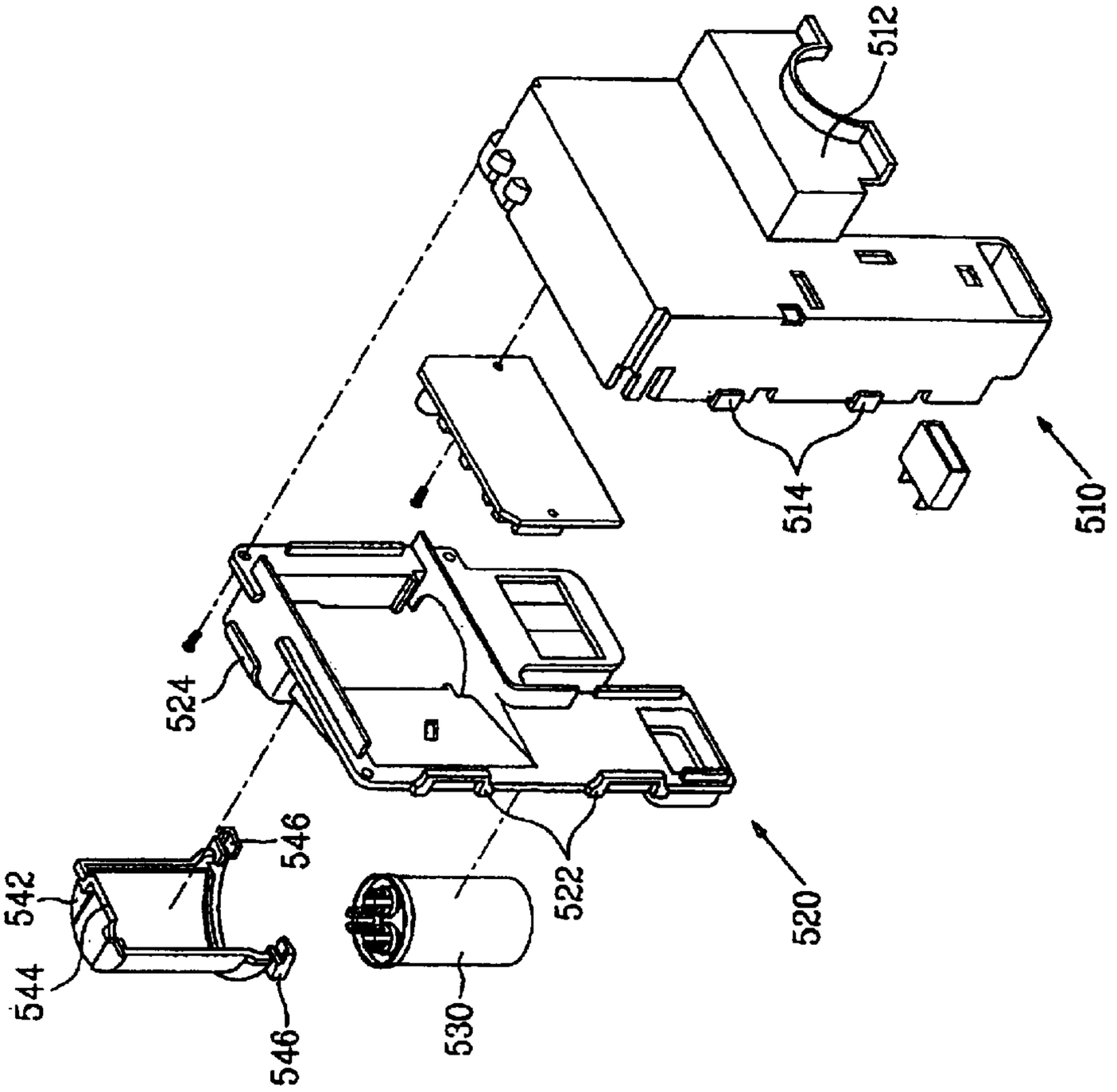

FIG. 20

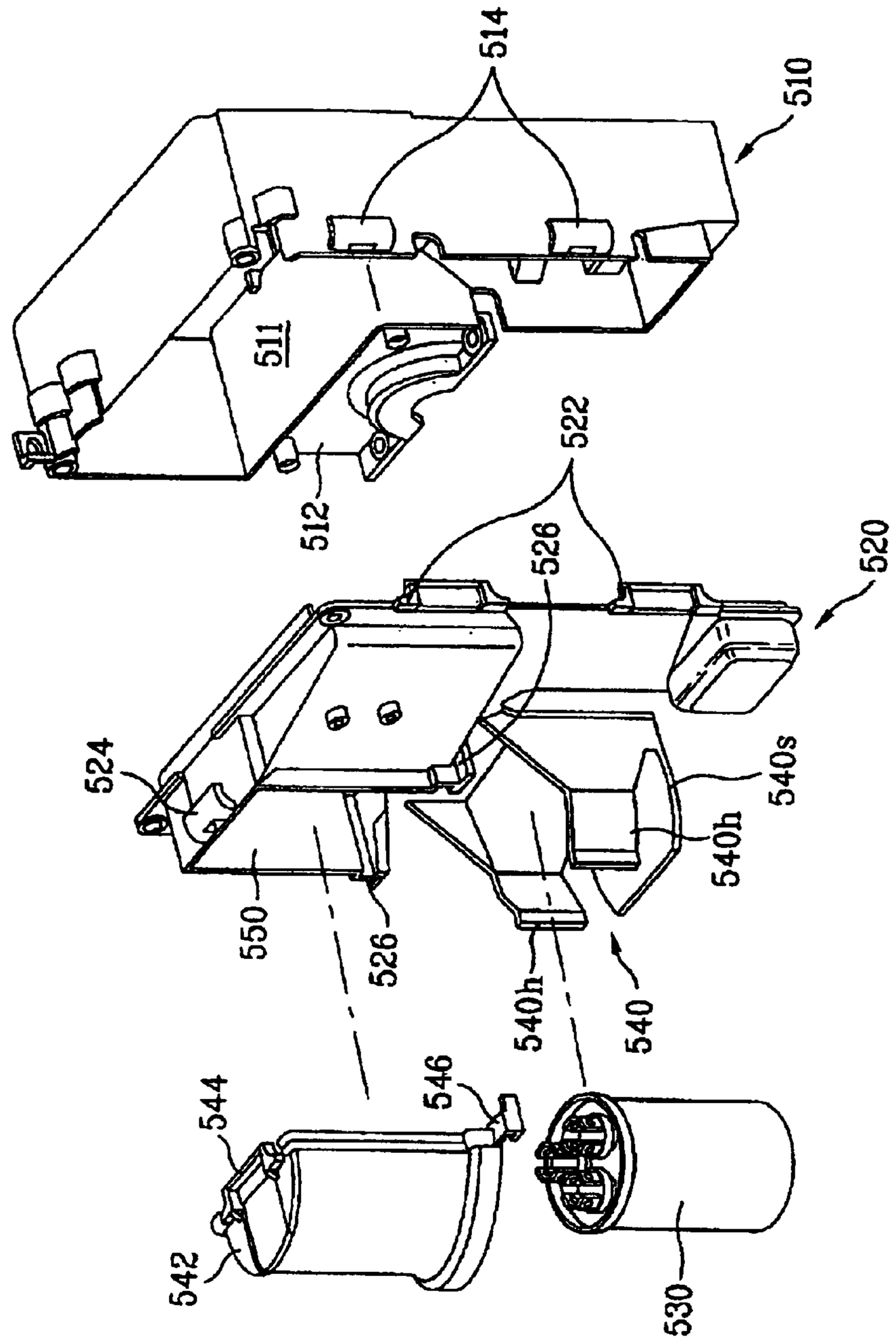
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FIG. 21

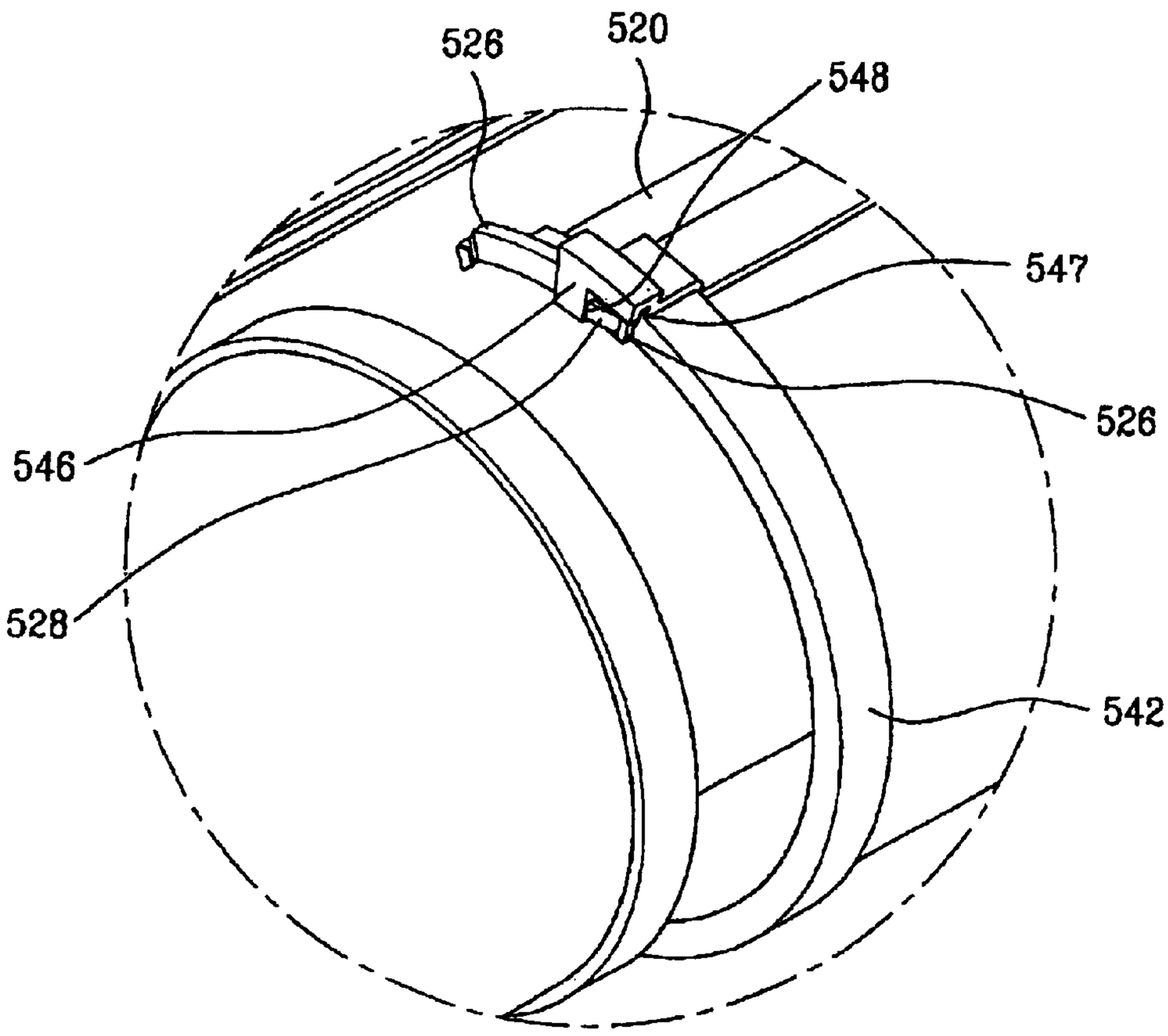
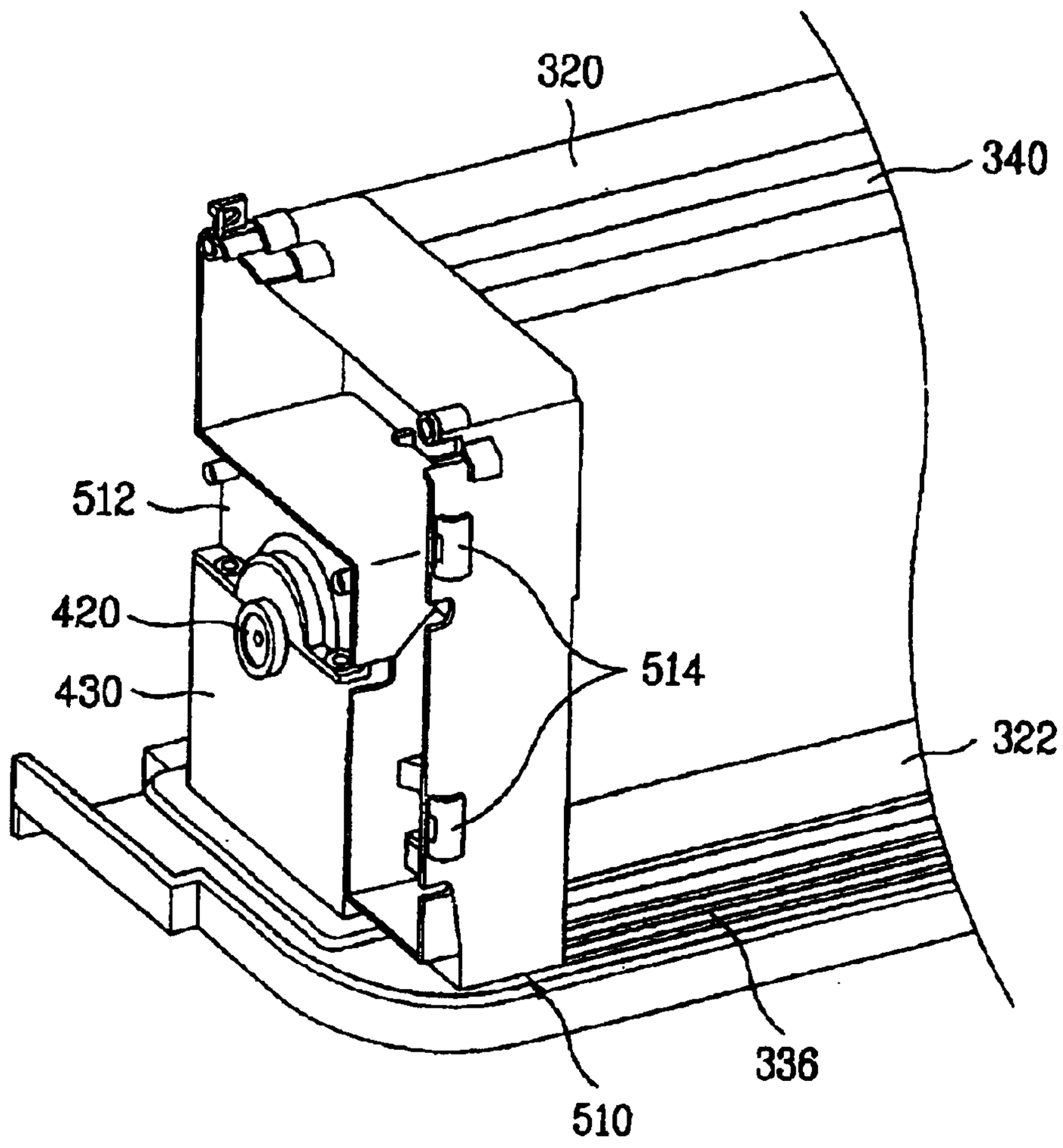


FIG. 22



UNIT TYPE AIR CONDITIONER

This application claims the benefit of the Korean Application Nos. P2003-0005362 filed on Jan. 27, 2003, P2003-0011813 filed on Feb. 25, 2003, P2003-0011814 filed on Feb. 25, 2003, P2003-0011909 filed on Feb. 26, 2003, and P2003-0013821 filed on Mar. 5, 2003, which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a unit type air conditioner.

2. Background of the Related Art

In general, the unit type air conditioner, with an indoor unit and an outdoor unit provided within one unit, is installed in a window of a building for air conditioning a space in the building.

A related art unit type air conditioner will be described, with reference to the attached drawings. FIG. **1** illustrates a disassembled perspective view of a related art unit type air conditioner, and FIG. **2** illustrates a section of a related art unit type air conditioner.

Referring to FIGS. **1** and **2**, there are a base plate **1** in a bottom part of the air conditioner, and a barrier **3** on the base plate **1** for dividing an inside part of the air conditioner into an indoor side and an outdoor side. There are first, and second sidewalls at opposite ends of the barrier **3**, and a third sidewall **6** between the first, and second sidewalls **5***a,* and **5***b*. The third sidewall **6**, fabricated separately from, and fitted to, the barrier **3**, divides the indoor side into a part air flows therein, and the other part no air flows therein.

There is a tray **9** on the base plate **1** of the indoor side for receiving condensed water from a surface of an indoor heat exchanger **11**. The indoor heat exchanger **11** over the tray **9** makes working fluid in a heat exchange cycle to heat exchange with air drawn from the room.

In the meantime, there is a heat exchanger cover **13** over the indoor heat exchanger **11** having opposite ends supported on the first sidewall **5***a* and the third sidewall **6**, respectively. There is a heater **15** in rear of the indoor heat exchanger **11**.

There is an indoor fan **17** between the first sidewall **5***a* and the third sidewall **6** for generating an air flow. The indoor fan **17** has one end fixed to a support plate **18** fitted to the first sidewall **5***a,* and the other end connected to a motor **19**. The motor **19** is held at a motor supporting part **20** of a metal fitted to the third sidewall **6**.

There is a scroll **21** between the indoor fan **17** and the barrier **3**. The scroll guides an air flow formed by the indoor fan **17**.

In the meantime, there is a panel **23** in a front part of the air conditioner. The panel **23** has a suction grill **24**, an air inlet, for drawing air, and an air outlet **25** for discharging air. The air outlet **25** has a guide member **27** for directing air guided by the scroll **21** to a desired direction, and the guide member **27** has louvers **29**.

The barrier **3** has a ventilation hole **30** for making the outdoor side and the indoor side in communication selectively to provide fresh air to the indoor side. The ventilation hole **30** has a filter **32** for filtering foreign matters from the air, and a ventilation door **34** for opening/closing the ventilation hole **30**.

There are a compressor **48** and an outdoor heat exchanger **38** of the heat exchange cycle on the base plate **1** on the outdoor side. The outdoor heat exchanger **38**, joined to a shroud **40** for guiding an air flow formed by the outdoor fan **42**, makes the working fluid in the heat exchange cycle to heat exchange with outdoor air.

The outdoor fan **42**, between the outdoor heat exchanger **38** and the shroud **40**, is connected to a rotation shaft of a motor **46** mounted on a motor mount **44**. Meanwhile, the shroud **40** is braced to the barrier **3** with a brace **49**.

In the drawing, an unexplained reference numeral **36** denotes a sleeve **36** forming an exterior of the air conditioner, and **22** denotes a top plate.

The operation of the related art air conditioner will be described based on cooling operation thereof.

Upon putting the air conditioner into operation, air circulations between insides to outsides of the air conditioner are formed by the indoor fan **17** and the outdoor fan **42**. In this instance, room air is drawn through the suction grill **24** by the indoor fan **17** on the indoor side, and heat exchanges at the indoor heat exchanger **11** to become air of relatively low temperature.

The air passed through indoor heat exchanger **11** is guided to the air outlet **25** by the scroll **21** through the indoor fan **17**, passes the guide member **27** where a direction of flow is fixed by the louvers, and is discharged to the room.

On the other hand, on the outdoor side, outdoor air is drawn through a rear surface of the sleeve **36** by the outdoor fan **42**, and guided through a space between the shroud **40** and the barrier **3**. Then, the outdoor air passes through the outdoor heat exchanger **38** via the outdoor fan **42**. In this instance, the outdoor heat exchanger **38** makes the outdoor air to heat exchange with the working fluid in the heat exchange cycle, and discharges heat from the room to an outside of the room.

However, the foregoing related art unit type air conditioner has the following problems.

The air drawn by the indoor fan is discharged to an inside space through the guide member guided by the scroll. However, the scroll and the guide member can not guide the air to different directions due to their nature of structure.

Second, the related art unit type air conditioner has the indoor fan fixed to the support plate. Therefore, separate fabrication of the support plate is required, and assembly is not convenient.

Third, the motor **19** is held at a motor supporting part **20** of a metal fitted to the third sidewall **6**. The motor supporting part is fastened to the third sidewall with fastening means, such as screws. Therefore, a process for mounting the motor is complicate. Moreover, since the motor is held only with the motor supporting part, the motor has not been held, rigidly.

SUMMARY OF THE INVENTION

Accordingly, the present invention is directed to a unit type air conditioner that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

An object of the present invention is to provide a unit type air conditioner in which a discharge guide is used for discharging air to different directions.

Other object of the present invention is to provide a unit type air conditioner, in which mounting of an indoor fan and indoor motor is simple, and the indoor fan can be mounted without any separate component.

Another object of the present invention is to provide a unit type air conditioner, in which capacitors and electric com-

ponents are provided to a separate space, for better performance of the air conditioner, and preventing spreading of fire an environment.

Additional features and advantages of the invention will be set forth in the description which follows, and in part will be apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims hereof as well as the appended drawings.

To achieve these objects and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, the unit type air conditioner includes a base plate in a bottom part thereof, a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof, a discharge frame in the discharge opening for controlling flow of the air discharged into the room, a barrier on a center part of the base plate to divide the base plate into indoor side base and an outdoor side base, an air guide on the indoor side base, having an indoor fan mounted therein, and a discharge guide for guiding the air passed through the air guide to the discharge frame.

The discharge guide has an upper section larger than a lower section, and the discharge guide includes a plurality of fastening parts engaged with the front panel, and a first rim engaged with the discharge frame in an upper part thereof.

The discharge guide includes a second rim in a lower part thereof, and the air guide includes mounting ribs **355** to be engaged with the second rim.

In other aspect of the present invention, there is provided a unit type air conditioner including a base plate in a bottom part thereof, a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof, a discharge frame in the discharge opening for controlling flow of the air discharged into the room, a barrier on a center part of the base plate to divide the base plate into indoor side base and an outdoor side base, and an upper air guide, and a lower air guide on the indoor side base, having an indoor fan mounted therein, for guiding air drawn therein by the indoor fan.

The indoor fan has one side connected to the indoor motor, and the other side held at a bearing assembly. The bearing assembly includes a bearing and a bearing cover surrounding the bearing.

The bearing assembly is held in the upper and lower air guide. For this, the lower air guide includes a semi-circular supporting part for holding the bearing assembly, and the upper air guide includes a second supporting part engaged with the first supporting part.

The first supporting part includes a circumferential extension projected therefrom for prevention of the bearing assembly from breaking away, and the second supporting part includes a circular slot to be engaged with the circumferential extension. The first supporting part includes a flat surface in an upper part or a lower part.

The first and second supporting parts include semi-circular projections from insides thereof respectively for inserting in the bearing assembly, and the bearing assembly includes an insertion groove in an outside circumferential surface thereof.

The lower air guide includes guide parts in a lower part thereof, and the upper air guide includes channel parts slidably inserted in the guide parts respectively.

The lower air guide includes tips on upper parts of opposite side surfaces respectively, and the upper air guide includes fastening holes engaged with the tips respectively.

The lower air guide includes guide parts in a lower part thereof, and the upper guide includes inwardly bent stepped parts for slidably inserting into the guide parts.

The lower air guide includes a semi-circular first motor supporting part for holding an end of the indoor motor, and the upper air guide includes a second motor supporting part engaged with the first motor supporting part. The indoor motor is mounted on an indoor motor mounting part having a semi-circular mounting surface.

In another aspect of the present invention, there is provided a unit type air conditioner including a base plate in a bottom part thereof, a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof, a discharge frame in the discharge opening for controlling flow of the air discharged into the room, a barrier on a center part of the base plate to divide the base plate into indoor side base and an outdoor side base, an air guide on the indoor side base, having an indoor fan mounted therein, and a discharge frame having grill parts for discharging air guided to a discharge opening by the air guide to opposite side parts, and a discharge grill between the grill parts for controlling an air flow direction.

The discharge grill is preferably detachable. The discharge grill includes a plurality of horizontal bars and vertical ribs under the horizontal bars for guiding air flow.

In further aspect of the present invention, there is provided a unit type air conditioner including a base plate in a bottom part thereof, a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof, a discharge frame in the discharge opening for controlling flow of the air discharged into the room, a barrier on a center part of the base plate to divide the base plate into indoor side base and an outdoor side base, an air guide on the indoor side base, having an indoor fan mounted therein, and a control box at a side of the air guide, having a body for fitting electric components therein, and a first cover for selective opening/closing of the body.

The body includes first hooks, and the first cover includes first fastening slots for fastening with the first hooks.

The first cover includes a first holding part for holding the capacitor therein, and a second holding part for fixing wires connected to the capacitor, and the first holding part includes a base plate for supporting a bottom of the capacitor, and a holder for surrounding an outside circumferential surface of the capacitor.

The second holding part includes a detachable second cover fitted thereto for protecting wires. The second holding part includes a second hook on a top thereof, and the second cover includes a second fastening slot on a top thereof for fastening to the second hook.

The second holding part includes first fastening members in a lower part thereof, and the second cover includes second fastening members for fastening to the first fastening members.

The first fastening member includes a stopper projected from an underside thereof, and the second fastening member includes an inserting channel for inserting the first fastening member, and a cut away part for holding the stopper.

The indoor motor has one side connected to the indoor fan, and the other side held at the control box. The control box includes a body for fitting electric components therein, having a motor cover for holding the indoor motor, and a first cover for selective opening/closing of the body.

It is to be understood that both the foregoing description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this application, illustrate embodiment(s) of the invention and together with the description serve to explain the principle of the invention. In the drawings;

FIG. **1** illustrates a disassembled perspective view of a related art unit type air conditioner;

FIG. **2** illustrates a section of a related art unit type air conditioner;

FIGS. **3** and **4** illustrate disassembled perspective views each showing a unit type air conditioner in accordance with a preferred embodiment of the present invention;

FIGS. **5** and **6** illustrate perspective views each showing a base plate in accordance with a preferred embodiment of the present invention;

FIG. **7** illustrates a perspective view of an upper shroud in accordance with a preferred embodiment of the present invention;

FIG. **8** illustrates a perspective view of a fastening structure of an outdoor motor and an outdoor fan;

FIGS. **9**A and **9**B illustrate disassembled perspective views each showing an air guide in accordance with a preferred embodiment of the present invention;

FIG. **10** illustrates a perspective view of a fastening structure of an indoor fan in accordance with a preferred embodiment of the present invention;

FIG. **11** illustrates a section showing the indoor motor in FIG. **10** in more detail;

FIG. **12** illustrates a perspective view showing an indoor motor mounting part in FIG. **10**;

FIG. **13** illustrates a perspective view showing a state an indoor motor is mounted on an indoor motor mounting part in accordance with a preferred embodiment of the present invention;

FIG. **14** illustrates a disassembled perspective view showing a fastening structure of an indoor fan and upper/lower air guides in accordance with a preferred embodiment of the present invention;

FIG. **15** illustrates a perspective view of a discharge guide in accordance with a preferred embodiment of the present invention;

FIG. **16** illustrates a section across a line A–A' in FIG. **15**;

FIG. **17** illustrates a perspective view showing a discharge guide and an air guide being connected in accordance with a preferred embodiment of the present invention;

FIG. **18** illustrates a section showing a state of an indoor side air flow in a unit type air conditioner in accordance with a preferred embodiment of the present invention;

FIGS. **19** and **20** illustrate disassembled perspective views each showing a control box in accordance with a preferred embodiment of the present invention;

FIG. **21** illustrates a perspective view showing a fastening structure of a second receiving part and a second cover part in accordance with a preferred embodiment of the present invention; and

FIG. **22** illustrates a perspective view showing a state an indoor motor is mounted in a motor cover in accordance with a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings. In describing the embodiments, identical parts will be given the same names and reference symbols, and repetitive description of which will be omitted. FIGS. **3** and **4** illustrate disassembled perspective views each showing a unit type air conditioner in accordance with a preferred embodiment of the present invention.

Referring to FIGS. **3** and **4**, the unit type air conditioner has a base plate **100** in a bottom part thereof. The base plate **100**, substantially rectangular, has a barrier **120** projected upward from a center part thereof. The barrier **120** divides the unit type air conditioner into a room part and an outdoor part.

There is a front panel **200** in a front part of the air conditioner to form a front exterior of the air conditioner. The front panel **200** is formed of a plastic, and includes a front frame **230**, a suction grill **210**, and an air filter **220**.

The suction grill **210**, fitted to the front frame **230**, passes the air drawn into the air conditioner, and the air filter **220**, fitted to a rear surface of the suction grill **210**, cleans the drawing air.

The front frame **230** has a discharge opening **230***a* in an upper part thereof, with a discharge frame **240** mounted thereon for passing air discharged from an inside of the air conditioner. There are discharge grill part **242** at opposite side part thereof formed as one unit with the discharge frame **240**, and detachable discharge grill **244** mounted on a central part of the discharge frame **240**. The discharge grill **244** has a plurality of horizontal bars **248** for controlling a direction of discharged air, and there are controllable vertical ribs **246** under the horizontal bars for guiding air flow. Reference symbol **232** denotes a display part.

The air conditioner has a cabinet **600**, forming both sides and a rear side thereof. The cabinet **600** has a plurality of openings for inlet and outlet of air, and is fitted to the base plate **100** and the front frame **230**.

There is a cover **650** on the cabinet **600** to form an upper exterior of the outdoor part. The cover **650** has one end with a cover ledge **660** joined with the front frame **230**, and an upper part with a cover grill **652** for introduction of the outdoor air.

An inside structure of the unit type air conditioner divided with the barrier **120** into the indoor part and the outdoor part will be described.

In the indoor part, there is an indoor heat exchanger **310**. The indoor heat exchanger **310** makes the air drawn from the room to heat exchange with the working fluid in the heat exchange cycle. The indoor heat exchanger **310** has an air guide **300** with an upper air guide **340** and a lower air guide **320** fitted thereto, and there is an indoor fan **410** (see FIG. **14**) in the air guide **300**.

There is a discharge guide **250** on the air guide **300** for guiding the air passed through the air guide **300** to the discharge openings **230***a*. The discharge guide **250** is in communication with the discharge frame **240**.

Next, in the outdoor part, an outdoor motor **810** is provided for driving the outdoor fan **820**. The outdoor motor **810** has a rotation shaft extended in opposite directions, one of which passes through the barrier **120** and extended up to an inside of the air guide **300**.

Also, in the outdoor part, there is a shroud for guiding air flow formed by the outdoor fan **820**. The shroud has a lower

shroud **130** and an upper shroud **850**, and a central opening **860** for mounting the outdoor fan **820** therein.

The shroud is fitted to the outdoor heat exchanger **830**. The outdoor heat exchanger **830** makes the outdoor air drawn by the outdoor fan **820** to heat exchange with the working fluid in the heat exchange cycle. The reference symbol **840** in the drawing denotes a compressor.

In the meantime, for installation of the unit type air conditioner, for blocking gap between the air conditioner and a window, or the like, a curtain assembly is used. The curtain assembly **700** has a curtain frame **710** and a curtain **720**, wherein the curtain frame **710** is joined with the cover ledge **660**. The reference numeral **500** denotes a control box for controlling operation of the air conditioner.

The unit type air conditioner will be described in more detail in light of components and joining therebetween, with reference to the attached drawings. FIGS. **5** and **6** illustrate perspective views each showing a base plate in accordance with a preferred embodiment of the present invention.

Referring to FIGS. **5** and **6**, the base plate **100** is divided into an indoor side base **100***a*, and an outdoor side base **100***b* with reference to the barrier **120** extended in a lateral direction. The indoor side base **100***a*, positioned on a room side when the air conditioner is installed in the window or the like of a building, forms a bottom of an indoor part, and the outdoor side base **100***b* form a bottom of an outdoor part. The barrier **120** has a drain hole **124** for guiding condensed water from the indoor heat exchanger **310** to the outdoor part. The outdoor side base **100***b* has the lower shroud **130** formed as one unit thereon. The lower shroud **130** has vertical reinforcing ribs **134** at opposite ends thereof for reinforcing the lower shroud **130**, each having an inversed triangular seat **136** on a top of the reinforcing rib **134**. The lower shroud has a semi-circular part **132** in a central part thereof, with a hole **138** in each of opposite ends.

In the meantime, referring to FIG. **6**, there is a motor mounting part **140** between the lower shroud **130** and the barrier **120**. The motor mounting part **140** has a semi-circular saddle **142** for seating the outdoor motor **810** thereon.

The motor mounting part **140** has a space (not shown) formed therein in communication with an outside of the air conditioner through the bottom thereof. The motor mounting part **140** has a plurality of slots **144** opened opposite to the lower shroud **130**. Therefore, the outdoor air is drawn into an inside of the air conditioner from below the base plate **100** through the slots **144**.

There is a lower grill **150** on one side of the motor mounting part **140** opened to the outside of the air conditioner, around which a guide plate is provided for guiding air drawn from below the base plate **100**.

There is a compressor mounting part **160** on the outdoor side base **100***b*. The compressor mounting part **160** has three fastening projections **162** at three apexes of a regular triangle. It is preferable that the fastening projections **162**, in general formed of metal, are provided at the time of injection molding of the outdoor side base **100***b*. Of course, a number and forms of the fastening projections **162** may be varied, and may be formed as one unit with the base plate **100**. There is a circular seat **163** around each of the fastening projections **162**. The seat **163** is provided with a damping device (not shown) fitted to a bottom of the compressor **840** for protecting the compressor **840** from vibration. There are a group of saddle like tips **164** projected upward from the outdoor side base **100***b* between the fastening projections **162**, to be fitted to a bottom of the compressor **840**.

In the meantime, the upper shroud **850** in on the lower shroud **130** fitted thereto. FIG. **7** illustrates a perspective view of an upper shroud in accordance with a preferred embodiment of the present invention.

Referring to FIG. **7**, the upper shroud **850** has a semi-circular part **852** opposite to the semi-circular part **132** of the lower shroud **130**. The upper shroud **850** also has a stepped part **854** on a side, and tips **856** to be inserted in the holes **138**. The stepped part **854** is seated on a side surface of the lower shroud **130** for rigid fastening of the upper and lower shrouds **130** and **850**. The tips **856** are inserted in the holes **138**, for joining the upper and lower shrouds **130** and **850**. When the upper shroud **850** joins with the lower shroud **130**, the semi-circular parts **132** and **852** of the upper and lower shrouds **130** and **850** form the opening **860** in communication with a side of the outdoor heat exchanger **830**. As described before, the outdoor fan **820** is mounted in the opening **860**, connected to the outdoor motor **810** mounted on the motor mounting part **140**.

FIG. **8** illustrates a perspective view of a fastening structure of an outdoor motor and an outdoor fan.

Referring to FIG. **8**, the outdoor fan **820** has a plurality of blades **821** and a fan slinger **822** connected between ends of the blades **821**. The fan slinger **822**, rotated with a shaft of the outdoor motor **810**, sprays condensed water introduced into the outdoor side base **100***b* through the drain hole **124** in the barrier **120** in cooling to the outdoor heat exchanger **830** in rear of the outdoor fan **822**. Thus, the fan slinger **822** drops a temperature of the outdoor heat exchanger **830**, to improve a cooling efficiency.

In the meantime, the air guide **300** having the upper air guide **340** and the lower air guide **320** is on the indoor side base **100***a*. The air guide **300** guides the air drawn by the indoor fan **410** (see FIG. **14**), and holds the indoor motor **420** (see FIG. **10**) connected to the indoor fan **410**, and a bearing assembly **440** (see FIG. **10**) to be described later.

FIGS. **9**A and **9**B illustrate disassembled perspective views each showing an air guide in accordance with a preferred embodiment of the present invention.

Referring to FIG. **9**A, the lower air guide **320** has a base **322** forming a bottom thereof, a rear wall part **324**, and first and second sidewall parts **326***a* and **326***b*. The base **322** has channels **336**. The channels **336** are formed for draining the condensed water from the indoor heat exchanger **310** over the base. The rear wall part **324**, having a round inside surface, is joined with the barrier **120** when the lower air guide **320** is mounted on the indoor side base **100***a*. There are tips **328** on upper parts of the first and second sidewall parts **326***a* and **326***b* respectively, for fastening the lower air guide **320** to the upper air guide **340**, and there is a semi-circular first supporting part **330** in the first sidewall part **326***a*. The first supporting part **330** has a width of semi-circular projection **332** from an inside, and the semi-circular projection **332** has a circumferential extension **334**.

There is a flat surface on the top of the first supporting part **330** for reinforcing the first supporting part **330**. The flat surface **335** may be formed on an under side of the first supporting part **330**, additionally.

Each of the first, and second sidewall parts **326***a*, and **326***b* has a guide part **329** in a lower part. The guide part **329** slidably receives a channel part **344** in the upper air guide **340**, and seals air leakage.

Moreover, there are a semi-circular first motor supporting part **338** for supporting the indoor motor **420** in the second sidewall part **326***b* of the lower air guide **320**, and a positioning plate **337** on one side of the second sidewall part **326***b* for mounting the indoor motor **420** thereon.

In the meantime, the upper air guide **340** has third and fourth sidewall parts **340***a* and **340***b,* and a guide surface **340***c* formed, and connected between upper parts of the third and fourth sidewall parts **340***a* and **340***b.* The guide surface, with a slope, guides an air flow formed by the indoor fan **410** in an upper direction.

The third, and fourth sidewall parts **340***a,* and **340***b* have fastening holes **342** engaged with the tips **328** on the first and second sidewall parts **326***a* and **326***b* respectively, and the fourth sidewall part **340***b* has a second motor supporting part **339** to be engaged with the first motor supporting part **338** in the second sidewall part **326***b.*

There is a second supporting part **346** in a lower part of the third sidewall part **340***a.* The second supporting part **346** is engaged with the first supporting part **330**, and has a circular slot **334***a* engaged with the circumferential extension **334** from the first supporting part **330**. There may be flat surfaces **335** on an upper part and/or lower part of the second supporting part **346** identical to the flat surfaces at the first supporting part **330**.

In the meantime, there are channel parts **344** in bottoms of the third and fourth sidewall parts **340***a* and **340***b.* As described before, the channel parts **344** are slidably engaged with the guide parts **329** in the sidewall parts **326***a,* and **326***b* in the lower air guide **320**.

Of course, there may be a variety of variations of the channel part **344**. For an example, as shown in FIG. **9**, inwardly bent stepped parts **345** may be formed at opposite sides of lower parts of the upper air guide **340** instead of the channel part **344**.

The indoor fan **410** is mounted in the air guide **300**.

FIG. **10** illustrates a perspective view of a fastening structure of an indoor fan in accordance with a preferred embodiment of the present invention.

Referring to FIG. **10**, a sirocco fan is employed as the indoor fan **410** for directing air drawn therein in a radial direction, and has a bearing assembly **440** on one side thereof.

The bearing assembly **440** has a bearing (not shown) therein, and a bearing cover **441** surrounding the bearing. The bearing cover **441**, in general formed of rubber, has an insertion groove in an outside circumference. The insertion groove **442** is engaged with semi-circular projection **332** on the first supporting part **330**.

The indoor fan **410** has the indoor motor **420** on the other side for providing power to the indoor fan **410**. The indoor motor **420** is mounted on the indoor motor mounting part **430** having a semi-circular mounting surface **432**.

FIG. **11** illustrates a section showing the indoor motor in FIG. **10** in more detail, FIG. **12** illustrates a perspective view showing an indoor motor mounting part in FIG. **10**, and FIG. **13** illustrates a perspective view showing a state an indoor motor is mounted on an indoor motor mounting part in accordance with a preferred embodiment of the present invention.

The indoor motor **420** will be discussed in more detail.

Referring to FIG. **11**, the indoor motor **420** has a rotation shaft **428**, a motor body **422**, and first, and second covers **424***a* and **424***b* in opposite side parts of the motor body **422**. There are first and second cover supplementary parts **426***a* and **426***b* at sides of the first, and second covers **424***a* and **424***b,* respectively. The first cover supplementary part **426***a* is seated on the mounting surface **432** in the indoor motor mounting part **430**, and the second cover supplementary part **426***b* is held with the first and second motor supporting part **338** and **339** in the upper and lower air guides **320** and **340**. The rotation shaft **428** of the indoor motor **420** is connected to the indoor fan **410**.

Referring to FIG. **12**, the indoor motor mounting part **430** has a bottom plate **431**, a pedestal **433** on the bottom plate **431**, the mounting surface **432** in an upper central part of the pedestal **433** for seating the first cover supplementary part **426***a,* and a cover seating part **434** at one side of the pedestal **433**. The cover seating part **434** has a form fit to an outside circumferential surface of the first cover **424***a.* It is preferable that the indoor motor mounting part **430** is formed of plastic.

Moreover, referring to FIG. **13**, the indoor motor **420** is mounted on the indoor motor mounting part **430**.

FIG. **14** illustrates a disassembled perspective view showing a fastening structure of an indoor fan and upper/lower air guides in accordance with a preferred embodiment of the present invention.

Referring to FIG. **14**, as described before, the indoor fan **410**, connected to the indoor motor **420** and the bearing assembly **440**, is held in the upper and lower air guide **320** and **340**.

In more detail, after mounting the bearing assembly **440** in the semi-circular projection of the first supporting part **330**, the stepped parts **345** of the upper air guide **340** are pushed in the guide part **329** of the lower air guide **320**. According to this, the first supporting part **330** and the second supporting part **346** surround the bearing assembly **440**, and the projections **328** from the lower air guide **320** are engaged with the fastening holes **342** in the upper air guide **340**. In this instance, the indoor motor mounting part **430** is engaged with the positioning plate **337** on the base **322** of the lower air guide **320**. At the same time with this, the indoor motor **320** is held at the first and second motor supporting parts **338** and **339** in the upper and lower air guides **320** and **340**.

Of course, the indoor motor mounting part **430** may be formed as one unit with the base **322**, or mounted on the indoor side base **100***a* of the base plate **100**.

In the meantime, the discharge guide **250** on the upper and lower air guides **320** and **340**. For this, mounting ribs **355** are formed in upper parts of the upper and lower air guide **320** and **340**, respectively.

FIG. **15** illustrates a perspective view of a discharge guide in accordance with a preferred embodiment of the present invention, and FIG. **16** illustrates a section across a line A–A' in FIG. **15**.

Referring to FIG. **15**, the discharge guide **250** has an upper section larger than a lower section. The discharge guide **250** has a plurality of fastening parts **258** around the upper part. The fastening parts **258** fasten the discharge guide **250** to a bottom of the discharge part **230***a* of the front frame **230**. Also, there is a first rim **259** around a top of the discharge guide **250** for easy engagement with the discharge frame **240**, and preventing leakage of air. There are fastening hooks **259***a* at a side of the first rim **259**, and mounting slots **259***b* in the first rim **259**. The mounting slots **259***b* are engaged with a mounting projection (not shown) in a bottom of the discharge frame **240**.

The discharge guide **250** is arranged to be in communication with the discharge frame **240**. Accordingly, the air guided by the discharge guide **250** is discharged through the discharge grill **244** and the discharge grill part **242** of the discharge frame **240**.

Referring to FIG. **16**, there is a second rim **260** around the bottom of the discharge guide **250** for engagement with the

air guide **300**. The second rim **260** is formed by cutting a thickness of a lower part of the discharge guide **250**.

FIG. **17** illustrates a perspective view showing a discharge guide and an air guide being connected in accordance with a preferred embodiment of the present invention.

Referring to FIG. **17**, the fastening between the upper and lower air guides **320** and **340** and the discharge guide **250** is made with the second rim **260** and the mounting ribs **355**. The mounting ribs **335** are formed in upper parts of the upper, and lower air guides **320** and **340**.

Thus, the upper part of the discharge guide **250** is fastened to the front frame **230** and the discharge frame **240**, and the lower part of the discharge guide **250** is fastened to the air guide **300**. According to this, the discharge guide **240** guides air from the indoor fan **410** inside of the air guide **300** toward the discharge frame **240**.

FIG. **18** illustrates a section showing a state of an indoor side air flow in a unit type air conditioner in accordance with a preferred embodiment of the present invention.

Referring to FIG. **18**, the air drawn by the indoor fan **410** is guided to the discharge guide **250** by the upper and lower air guides **320** and **340**. Then, the air is guided to the discharge frame **240** by the discharge guide **250**. Then, the air guided by the discharge frame **240** is also discharged through the grill part **242** in opposite side parts of the discharge grill **244**.

In the meantime, there is a control box **500** at a side of the air guide **300**, having electric components fitted therein for controlling the air conditioner.

FIGS. **19** and **20** illustrate disassembled perspective views each showing a control box in accordance with a preferred embodiment of the present invention.

Referring to FIGS. **19** and **20**, the control box includes a body **510** having a holding part **511** therein, and a first cover **520** fastened to the body **510**. The body **510** has a motor cover **512** for holding the indoor motor **420**, and first hooks **514** for fastening with the first cover **520**.

The first cover **520** has first fastening slots **522**, for fastening with the first hooks **514**. According to this, the first cover **520** rotates around a part the slots **522** are formed therein as an axis in closing the holding part **511** of the body **510**. The cover **520** may be fastened to the body **510** with screws more rigidly. The cover **520** has a first holding part **540** for holding the capacitor **530** therein.

The first holding part has a base plate **540***s* for supporting a bottom of the capacitor **530**, and a holder **540***h* for surrounding an outside circumferential surface of the capacitor **530**. Of course, the first holding part **540** may hold electric components other than the capacitor **530**. There is a second holding part **550** over the first holding part **540** for fixing wires and the like connected to the capacitor **530**. Thus, the capacitor **530** is not held in the holding part **511** in the body **510**, but in the first holding part **540**. That is, the capacitor **530** has a bottom supported on a base plate **540***s*, and an outside circumferential surface held in the holder **540***h*. Thus, the capacitor **530** is fitted at a position separated from the electric components fitted in the holding part **511** of the body **510**. Thus, the capacitor **530** and the other electric components can avoid giving/receiving electrical/thermal influences.

In the meantime, the second holding part **550** has a second cover **542** detachably fitted thereto. The second cover **542** is semi-cylindrical, and has a second fastening slot **544**. The second fastening slot **544** is fastened to a second hook **524** over the second holding part **550**. There are first fastening members **526** in a lower part of the second holding part **550**, and the second cover **542** has second fastening members **546** to be fastened to the first fastening members **526**. According to this, the second cover **542** is fastened to the second holding part **550** with the second fastening slot **544** and the second fastening members **546**. Thus, the second cover **542** closes the second holding part **550** for protecting wires and the like therein from an external impact or force.

FIG. **21** illustrates a perspective view showing a fastening structure of a second receiving part and a second cover part in accordance with a preferred embodiment of the present invention.

Referring to FIG. **21**, there is a stopper **528** projected from an underside of the first fastening member **526**, and the second fastening member **546** has an inserting channel **547** and a cut away part **548**.

The stopper **528** with a slope is held at the cut away part **548**, and the inserting channel **547** has the first fastening member **526** inserted therein. That is, when the second cover **542** rotates around the second hook **524**, until the second cover **542** comes into close contact with the first cover **520**, the first fastening member **526** is inserted in the inserting channel **547**. Then, the second fastening member **546** deforms elastically, and moves along the slope of the stopper **528**. The second fastening member **546** moves until the stopper **528** is held at the cut away part **548**. Once the stopper **528** is held at the cut away part **548**, the second fastening member **546** is fastened to the first fastening member **526**. According to this, the second cover **542** can be fastened to the first cover **520** with the first and second fastening members **526** and **546**, without any additional screws or the like. Of course, the fastening structure is merely one embodiment, and a variety of embodiments are available. For an example, the first and second covers **520** and **542** may be fastened with simple hooks or screws.

The indoor motor **420** is mounted in the motor cover **512** of the body **510**. FIG. **22** illustrates a perspective view showing a state the indoor motor is mounted in the motor cover in accordance with a preferred embodiment of the present invention.

Referring to FIG. **22**, the indoor motor **420** has one end held at the first and second motor supporting parts **338** and **339** of the upper and lower air guides **320** and **340**, and the other end seated on the indoor motor mounting part **430** on the base **322** of the lower air guide **320**. Moreover, an upper part of the other end of the indoor motor **420** is covered with the motor cover **512** of the body **510**. The motor cover **512** covers the indoor motor **420**, and fastened to the indoor motor mounting part **430**.

The operation of the unit type air conditioner will be described.

The air conditioner of the present invention can be operated in a cooling mode or a heating mode. In this specification, cooling operation will be described, as an example.

Upon putting the air conditioner into operation, the indoor fan **410** is rotated, to draw room air through the suction grill **210** in the front panel **200**. The air drawn through the suction grill **210** is cleaned at the air filter **220**, heat exchanges with the working fluid in the heat exchange cycle at the indoor heat exchanger **310**.

Then, the air is guided to the discharge guide **250** by the air guide **300**, and discharged to the room again through the discharge grill **244** and the grill part **242** in the discharge frame **240**. The air discharged thus circulates, and cools the room, and introduced into the air conditioner through the

suction grill **210** again. This process is repeated continuously during the air conditioner is operated.

On the other hand, the working fluid having heat transferred at the indoor heat exchanger **310** is introduced into the outdoor heat exchanger **830**, where the working fluid heat exchanges with air drawn from outside of the air conditioner, to discharge the heat to the outside of the air conditioner.

In more detail, when the outdoor fan **820** is operated by the outdoor motor **810**, outdoor air is drawn into the outdoor side of the air conditioner through opening **860** in the cabinet **600**. The drawn outdoor air is introduced to the outdoor fan **820** through the shrouds **130** and **850**, and the barrier **120**, and guided to the outdoor heat exchanger **830**. Then, the outdoor air guided to the outdoor heat exchanger **830** is discharged to a rear side of the cabinet **600** after the outdoor air heat exchanges with the working fluid in the heat exchange cycle.

As has been described, the unit type air conditioner of the present invention has the following advantages.

First, the discharge guide is in communication with the discharge frame having the discharge grill and the grill parts. Therefore, the air guided by the discharge guide is discharged, not only upward, but also in both sides by the discharge grill and the grill parts. That is, the unit type air conditioner of the present invention discharges to different directions at the same time, permitting to improve an operation efficiency.

Second, the joining of the indoor fan and the air guide is made as the air guide holds the bearing assembly and the indoor motor that hold a shaft of the indoor fan. Therefore, no additional component is required for holding the indoor fan, that reduces a production process. Moreover, since the indoor motor is also held by the air guide, assembly becomes easy.

Third, the capacitor is held in the first holding part, and other electric components are fitted in the holding part inside of the body. Therefore, electrical/thermal interferences between the capacitor and the electric components can be avoided, to improve operation characteristics of the air conditioner. Moreover, spread of fire from the capacitor or the electric components to an environment can be cut off, effectively. Since the first cover is made to open the holding part in the body, maintenance of the electric components fitted to the body is easy. The holding of the indoor motor with the motor cover of the body of the control box permits a rigid holding of the indoor motor.

It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A unit type air conditioner comprising:

a base plate in a bottom part thereof;

a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof;

a discharge frame in the discharge opening for controlling flow of the air discharged into the room;

a barrier on a center part of the base plate which divides the base plate into indoor side base and an outdoor side base;

an air guide on the indoor side base, having an indoor fan mounted therein;

a discharge guide for guiding the air passed through the air guide to the discharge frame wherein the discharge guide includes a first rim that engages the discharge frame.

2. The unit type air conditioner as claimed in claim **1**, wherein the discharge guide has an upper section larger than a lower section.

3. The unit type air conditioner as claimed in claim **1**, wherein the discharge guide includes a plurality of fastening parts that engages with the front panel, and wherein the first rim engages the discharge frame in an upper part thereof.

4. The unit type air conditioner as claimed in claim **1**, wherein the discharge guide includes a second rim in a lower part thereof, and the air guide includes mounting ribs to be engaged with the second rim.

5. A unit type air conditioner comprising:

a base plate in a bottom part thereof;

a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof;

a discharge frame in the discharge opening for controlling flow of air discharged into a room;

a barrier on a center part of the base plate which divides the base plate into indoor side base and an outdoor side base;

an upper air guide, and a lower air guide on an indoor side of the base, having an indoor fan mounted therein, for guiding air drawn therein by the indoor fan, wherein the lower air guide includes a first motor supporting part for holding an end of an indoor motor connected to the indoor fan and the upper air guide includes a second motor supporting part that engages the first motor supporting part.

6. The unit type air conditioner as claimed in claim **5**, wherein the indoor fan has one side connected to the indoor motor, and the other side held at a bearing assembly.

7. The unit type air conditioner as claimed in claim **6**, wherein the bearing assembly includes a bearing and a bearing cover surrounding the bearing.

8. The unit type air conditioner as claimed in claim **6**, wherein the bearing assembly is held in both the upper and lower air guide.

9. The unit type air conditioner as claimed in claim **8**, wherein the lower air guide includes a semi-circular supporting part for holding the bearing assembly, and

the upper air guide includes a second supporting part engaged with the semi-circular supporting part.

10. The unit type air conditioner as claimed in claim **9**, wherein the first supporting part includes a circumferential extension projected therefrom for holding the bearing assembly in place, and

the second supporting part includes a circular slot which engages the circumferential extension.

11. The unit type air conditioner as claimed in claim **9**, wherein the semi-circular supporting part includes a flat surface in an upper part or a lower part.

12. The unit type air conditioner as claimed in claim **9**, wherein each of the first and second supporting parts includes a semi-circular projection for insertion into the bearing assembly.

13. The unit type air conditioner as claimed in claim **12**, wherein the bearing assembly includes an insertion groove in an outside circumferential surface thereof.

14. The unit type air conditioner as claimed in claim **5**, wherein the lower air guide includes guide parts in a lower part thereof, and the upper air guide includes channel parts slidably inserted in the guide parts.

15. The unit type air conditioner as claimed in claim 5, wherein the lower air guide includes tips on upper parts of opposite side surfaces, and the upper air guide includes fastening holes engaged with the tips.

16. The unit type air conditioner as claimed in claim 5, wherein the lower air guide includes guide parts in a lower part thereof, and the upper guide includes inwardly bent stepped parts for slidably inserting into the guide parts.

17. The unit type air conditioner as claimed in claim 6, wherein the first motor supporting part is semi-circular.

18. The unit type air conditioner as claimed in claim 6, wherein the indoor motor is mounted on an indoor motor mounting part having a semi-circular mounting surface.

19. A unit type air conditioner comprising:

a base plate in a bottom part thereof,

a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof;

a discharge frame in the discharge opening for controlling flow of the air discharged into the room;

a barrier on a center part of the base plate which divides the base plate into an indoor side base and an outdoor side base;

an air guide on the indoor side base, having an indoor fan mounted therein; and

a discharge frame having grill parts disposed at opposite sides of the discharge frame for discharging air guided to a discharge opening by the air guide to opposite sides of the discharge frame, and a discharge grill between the grill parts for controlling an air flow direction.

20. The unit type air conditioner as claimed in claim 19, wherein the discharge grill is detachable.

21. The unit type air conditioner as claimed in claim 19, wherein the discharge grill includes a plurality of horizontal bars and vertical ribs under the horizontal bars for guiding air flow.

22. A unit type air conditioner comprising:

a base plate in a bottom part thereof;

a front panel forming a front exterior of the air conditioner, having a discharge opening in an upper part thereof;

a discharge frame in the discharge opening for controlling flow of air discharged into a room;

a barrier on a center part of the base plate which divides the base plate into an indoor side base and an outdoor side base;

an air guide on the indoor side base, having an indoor fan mounted therein;

a control box at a side of the air guide, having a body for fitting electric components therein, and a first cover for selective opening/closing of the body wherein the first cover includes a first holding cart for holding a capacitor therein.

23. The unit type air conditioner as claimed in claim 22, wherein the body includes first hooks, and the first cover includes first fastening slots for fastening with the first hooks.

24. The unit type air conditioner as claimed in claim 22, wherein the first cover further includes

a second holding part for fixing wires connected to the capacitor.

25. The unit type air conditioner as claimed in claim 24, wherein the first holding part includes:

a base plate for supporting a bottom of the capacitor; and

a holder for surrounding an outside circumferential surface of the capacitor.

26. The unit type air conditioner as claimed in claim 24, wherein the second holding part includes a detachable second cover fitted thereto for protecting wires.

27. The unit type air conditioner as claimed in claim 26, wherein the second holding part includes a second hook on a top thereof, and the second cover includes a second fastening slot on a top thereof for fastening to the second hook.

28. The unit type air conditioner as claimed in claim 26, wherein the second holding part includes first fastening members in a lower part thereof, and the second cover includes second fastening members for fastening to the first fastening members.

29. The unit type air conditioner as claimed in claim 28, wherein the first fastening member includes a stopper projecting from an underside thereof, and the second fastening member includes an inserting channel for inserting the first fastening member, and a cut away part for holding the stopper.

30. The unit type air conditioner as claimed in claim 22, wherein the indoor motor has one side connected to the indoor fan, and the other side held at the control box.

31. The unit type air conditioner as claimed in claim 30, wherein the control box includes:

a body for fitting electric components therein, having a motor cover for holding the indoor motor; and

a first cover for selective opening/closing of the body.

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